Emotional Load Identification in the Political Discourse

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Abstract

It is known that the political discourse "attack" on the two plans: of conviction (rational dimension) and of persuasion (emotional dimension), we proposed to analyse from lexical-semantic level all those discursive means that speaker's political succeed to change attitudes, opinions, feelings and political beliefs by his auditor. In this paper we identify the author's vocabulary which betrays his sensibility, more or less dramatic. By emphasizing the emotional component at the level of discourse, voters identify with the speaker, who becomes the personification of their common ideals. The idea is that the vocabulary betrays the speaker's level of drama and characterizes the speaker's orientation. When the object of study is the political discourse, especially in electoral context, an investigation on this dimension could give points to features influencing the voting public.

In this sense, we describe a platform (Discourse Analysis Tool – DAT) which integrates a range of language processing tools with the intent to build complex characterisations of the political discourse. An important political language processing problem is the text categorization. One of the important steps in our research was the classification task of the political emotional lexicon.

The method is intended to help political speakers to improve their discourse abilities, by comparing their speeches, and the public at large by evidencing hidden aspects of the emotional-linguistic abilities of their candidates. The platform integrates a library of statistical functions allowing comparisons on the same set of features of discourses produced by different speakers.

Keywords: *political discourse, natural language processing, elections, semantic analysis, presidential, journalist.*

1. Introduction

The motivation for our study relies on the need for objectivity in the interpretation of the political language situated at the intersection of three important symbolic spaces: the political space, the public space and the communicational space, as well as on the need to measure to what extend a discourse can influence its direct receptor, the electorate and in what ways.[1] The current approaches in analysing the political language are based on Natural Language Processing (NLP) techniques designed to investigate lexical-semantic aspects of the discourse. The domain of NLP includes a theoretically motivated range of computational techniques for analyzing and representing naturally occurring texts at one or more levels of linguistic analysis for the purpose of achieving human-like language processing for a range of tasks or applications.[2]

In this paper we describe a platform (Discourse Analysis Tool – DAT) which integrates a range of language processing tools with the intent to build complex characterisations of the political discourse. A linguistic portrait of an author is drawn by putting together features extracted from the following linguistic layers: lexicon and morphology (richness of the vocabulary, rare co-occurrences, repetitions, use of synonyms, coverage of verbs' grammatical tenses, etc.), semantic (semantic classes used) and syntax (complexity of syntactic constructions, the frequency of relative clauses, length of the sentences, number of clauses in sentences, subordinate/coordinate structures, etc.).

Among the resources used for the study of natural language syntax, of a tremendous importance are the treebanks, large collections of sentences annotated by human experts at syntactic structures. The collection described in this paper refers to the Romanian language and has been acquired with the help of an interactive graphical tool which allowed easy annotation, visualisation and modification of syntactic trees, initially obtained as a result of an automatic parsing process.

Our purpose was to develop a computational platform able to offer to researchers in mass-media and political sciences, to political analysts, to the public at large (interested to consolidate their options before elections), and, why not, even to politicians themselves, the possibility to measure different parameters of a

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[1] D. D. Perlmutter, *The Manship School guide to political communication*, Baton Rouge, Louisiana State University Press, 1999, pp. 23-109.

[2] E. D. Liddy, "Natural Language Processing," in *Encyclopedia of Library and Information Science*, 2nd Ed. NY. Marcel Decker, Inc., 2001.

written political discourse. The paper is structured as follows. Section 2 shortly describes the previous work. Section 3 discusses the lexical, semantic and syntactic features having rhetorical values and section 4 presents a platform for multi-dimensional political discourse analysis. Next, the section 5 discusses an example of comparative analysis of discourses very distant in time, elaborated during elections. Finally, Section 6 highlights interpretations anchored in our analysis and presents conclusions.

2. Previous work

As we will see, one aspect of the platform that we present touches a lexical-semantic functionality, which has some similarities with the approach used in Linguistic Inquiry and Word Count (LIWC).[3] There are, however, important differences between the two platforms. LIWC-2007[4] is basically counting words and incrementing counters associated with their declared semantic classes. In the lexicon, words can be given by their long form, as a complete string of characters, or abbreviated, in which case the sign '*', placed in a terminal position, plays the role of the universal jolly-joker, replacing any character. For each text in the input, LIWC produces a set of tables, each displaying the occurrences of the word-like instances of the semantic classes defined in the lexicon, as sub-unitary values. For each semantic class, such a value is computed as the number of occurrences of the words corresponding to that class divided by the total number of words in the text. It remains in the hands of the user to interpret these figures. And there is no support for considering lexical expressions.

A previous version of DAT performs part-of-speech (POS) tagging and lemmatization of words. The lexicon contains a collection of lemmas (6000) having the POS categories: verb, noun, adjective and adverb. In the context of the lexical semantic analysis, the pronouns, numerals, prepositions and conjunctions, considered to be semantically empty, have been left out. Our version includes 30 semantic classes, chosen to fit optimally with the necessities of interpreting the political discourse, two of them being added recently.

The second range of differences between the two platforms regards the user interface. In DAT, the user is served by a friendly interface, offering a lot of services: opening one or more files, displaying the file/s, modifying/editing and saving the text, functions of undo/redo, functions to edit the lexicon, visualization

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[3] J. W. Pennebaker, Martha E. Francis and R. J. Booth, *Linquistic Inquiry and Word Count – LIWC2001*, Mahwah, NJ, Erlbaum Publishers, 2001.

[4] Retrieved from www.liwc.net, on December 2, 2010.

of the mentioning of instances of certain semantic classes in the text, etc. Then, the menus offer a whole range of output visualization functions, from tabular form to graphical representations and to printing services. Finally, another important development for semantic approach was the inclusion of a collection of formulas which can be used to make comparative studies between different subjects. A special section of the lexicon includes expressions. An expression is defined as a sequence: <root-list> => <semlist>, in which <root-list> is a list of roots of words, therefore each optionally followed by the '*' sign.[5] and[6] report similar approaches of human validation.

Completely new in DAT in comparison with other approaches is the facility for analyzing the political discourse from the syntactic point of view. DAT helps the user to identify and count relations between different parts of speech, to put in evidence patterns of use at the semantic and syntactic level, etc.

3. Lexical, semantic and syntactic features with rhetorical values

The study of political language should necessarily to rooted in an interdisciplinary approach, in which the sciences of the rhetoric, of the communication and politology cooperate with linguistics. The use of language in politics has a "sanctifying" role[7] in the tentative to gain the trust of the electorate. The object of language could seem sometimes incoherent, unfinished, deprived of sense, etc., if confronted against general rules or principles of the language, but it can still be deciphered and function adequately. The deviation from the rules of language construction can be intended, in which case it is commanded by some rhetorical or aesthetic goals, expressing thus strategic aspects of the production of discourse, or can represent social or cognitive characteristics of the speakers, as "memory limits, lacks in culture, etc."[8]

The trajectory of rhetorics (as a theory of discourse persuasivity) has been intimately interlinked with the political discourse (space of power legitimacy, lat.

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[5] D. Gîfu and D. Cristea, "Computational Techniques in Political Language Processing: AnaDiP-2011," in J. J. Park, L. T. Yang and C. Lee (Eds.), *FutureTech 2011*, Part II, CCIS 185, 2011, pp. 188-195.

[6] D. Gîfu, *Violenţa simbolică în discursul electoral* (The Violence of Symbols in electoral discourse), Casa Cărţii de Ştiinţă, Cluj-Napoca, 2010.

[7] Murray Edelman, *The Symbolic Uses of Politics*, University of Illinois Press, Urbana, 1985. Originally published in 1964.

[8] Teun A. van Dijk, *Textual Structures of News in the Press. Working notes*, University of Amsterdam, Department of General Literary Studies, Section of Discourse Studies, 1972, p. 14.

discursus politicus) since Antiquity till our days. The only means to impose yourself in the public life is to convince by spreading your word. Today, the art of rhetorical discourse is understood only in correlation with performance, by combining in a highly elaborate way four ingredients: be rational, have ideas, master the language, use an adequate style. It is extremely difficult to make an objective evaluation of this magic mélange of methods, but at least some parts of it can be measured. It is what we try to do in this research.

3.1. THE LEXICAL-SEMANTIC PERSPECTIVE

The political speaker is determined to collect empathy and to convince the public.

Yet placing himself within the general limits of the political goals, very often a skilful politician studies the public for fixing the type of vocabulary and the message to be delivered. He might exploit connections between more daring ideological categories (as is for instance the class *nationalism*) and those generally accepted (for instance, belonging to the classes *social*, *work*, *home*). The present day political language puts in value the virtues of the metaphor, its qualities to pass abruptly from complex to simple, from abstract to concrete, imposing a powerful subjective, emotional, dimension to the discourse (the class *emotional*). The political metaphor may loose the virtues of poetical metaphor, becoming vulgar (the class *injuries*), in the etymological sense of the word.

3.2. THE SYNTACTIC PERSPECTIVE

Regarded as one of the most developed branches of semiotics, syntactic analysis aims at studying the relations between signs and the logical and grammatical structure at the sentence level.[9] Outside the sentence, rhetorical relations identify particular interdependencies that can hold between adjacent spans of text. Based on relations, the rhetorical schemes define patterns in which a particular span of text can be analyzed. But if we remain at the level of syntax, the text is formed out of an ordered sequence of language signs which are governed by a set of combinatorial rules.[10]

From this perspective, the syntactic analysis of political language aims at identifying patterns or idiosyncrasies in the written phrase of an author: the

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[9] W. C. Mann and S. A. Thompson, "Rhetorical Structure Theory: Toward a functional theory of text organisation", *Text* 8(3), 1988, pp. 243-281.

[10] Heinrich F. Plett, *Ştiinţa textului şi analiza de text* (The science of text and text analysis), Univers Publishing House, Bucharest, 1983, p. 55.

repeated use of some syntactic relations or linking expressions, their characterization as coordination or subordination, degree of breaking the grammar rules, etc.

4. A platform for multi-dimensional political discourse analysis

The concept behind the platform described in this paper is that the manner in which individuals speak and write betrays them. As such, the vocabulary opens a window towards the author's sensibility, his/her level of culture, her/his cognitive world, and, of course, the semantic spectrum of the speech, while the syntax may reveal the level of culture, intentional persuasive attitudes towards the public, etc.

Some of these means of expression are intentional, aimed to deliver a certain image to the public, while others are unintentional.

The Discourse Analysis Tool (currently at version 2) considers the political discourse from two perspectives: lexical-semantic and syntactic. The vocabulary covers 30 semantic classes, detailed below, considered to fulfil optimally the necessity of interpreting the political discourse in electoral contexts.

```xml
<?xml version="1.0" encoding="UTF-8"?>
-<classes>
<class name="swear" id="1"/>
<class name="social" id="2"/>
<class name="family" id="3" parent="2"/>
<class name="friends" id="4" parent="2"/>
<class name="people" id="5" parent="2"/>
<class name="emotional" id="6"/>
<class name="positive_emotional" id="7" parent="6"/>
<class name="negative_emotional" id="8" parent="6"/>
<class name="Anxiety" id="9" parent="8"/>
<class name="Anger" id="10" parent="8"/>
<class name="Sadness" id="11" parent="8"/>
<class name="cognitive" id="12"/>
<class name="intuition" id="13" parent="12"/>
<class name="determine" id="14" parent="12"/>
<class name="uncertain" id="15" parent="12"/>
<class name="certain" id="16" parent="12"/>
<class name="inhibition" id="17" parent="12"/>
<class name="perceptual" id="18"/>
<class name="see" id="19" parent="18"/>
```

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<class name="hear" id="20" parent="18"/>
<class name="feel" id="21" parent="18"/>
<class name="sexual" id="22"/>
<class name="work" id="23"/>
<class name="achievements" id="24"/>
<class name="failure" id="25"/>
<class name="agreement" id="26"/>
<class name="home" id="27"/>
<class name="financial" id="28"/>
<class name="religion" id="29"/>
<class name="nationalism" id="30"/>
</classes>
```

Our interest went mainly in determining those political attitudes able to influence the voting decision of the electorate. But the system can be parameterised to fit also other conjunctures: the user can define at will her/his semantic classes and the associated lexica, which, as can be noticed, are partially placed in a hierarchy.

The development of the lexicon associated with these classes was done in several phases. We started with a small vocabulary (mainly looking for translation equivalents in Romanian of a subset of the LIWC-2007 classes). The words of this initial lexicon have been used as seeds in a trial to enrich the lexicon automatically by using DEX-online[11], the greatest public online dictionary for Romanian. To display the results, the platform incorporates two alternative views: graphical (pie, function, columns and areas) and tabular (Microsoft Excel compatible).

The new part of the platform offers also a range of syntactic analysis facilities. To cope with syntax, a dependency parser for Romanian has been trained on a dependency treebank. This corpus of syntactic trees (incorporating now over 3,500 tree structures) has been developed helped by a graphical editing tool (TreeAnnotator) and, later on, by the dependency parser itself. After the corpus reached the dimension of 1,000 structures, the development of the resource continued in a bootstrapping manner: the candidate new sentence was first parsed by the parser and then manually corrected. This way, the development of the corpus gained very much in speed. The format of the stored trees is XML, with the following elements:

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[11] Retrieved from www.dexonline.ro, on December 2, 2010.

• sentence – marking the sentences; its attributes are: a unique identifier and the name of the annotator who lastly worked over the sentence;

• word – marks individual words of the sentence; its attributes are: a unique identifier, the morphological tag, the lemma form of the inflected word, the ID of its parent word (the head in a dependency structure) and the name of the relation linking the word to its parent.

5. A comparative study

5.1 THE CORPUS

The corpus used for our investigation was configured to allow a comparative study over the discursive characteristics of two political leaders, both embracing liberal convictions, although in quite distant periods. The first one, I. C. Brătianu, is known as having led the basis of the liberal ideology in Romania, one of the most complex personalities of the Romanian history. The second political actor was chosen based on similar criteria: Crin Antonescu, a liberal political leader, right now in power. We are, this way, putting on the balance two styles of political discourse that are distant in time by one century and a half, interval which witnessed many changes in the state (the union of the Romanian provinces, wars, economical crises, etc.)

For the elaboration of preliminary conclusions over the two elections processes, conducted in December 1858 and November 2009, in Romania,[12] we collected, stored and parsed manually and automatically, political texts published by four national publications having similar profiles.[13] The corpus includes a collection of 1548 political sentences (units), each containing one or more clauses.

5.2. THE LEXICAL-SEMANTIC ANALYSES

Apart from simply computing frequencies, the system can also perform comparative studies. The assessments made are comprehensive over the selected classes because they represent averages on collections of texts, not just a single text.

To exemplify, we present below a chart with two streams of data, representing the political texts in electoral context between the two liberal leaders mentioned above.

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[12] G. Marinescu and C. Grecescu (ed.), "Ion C. Brătianu. Acte şi cuvântări" (Documents and speeches), vol. I – part I (june 1848 = december 1859), Cartea Românească, Bucharest, 1938, pp. 228-237.

[13] *Românul* (19th century), *Evenimentul zilei*, *Gândul* and *Ziua* (our days).

Our experience shows that an absolute difference value below the threshold of 0.5% should be considered as irrelevant and, therefore, ignored in the interpretation.

So, the graphical representation in Figure 1, in which the present day politician (in blue), is compared against the outstanding politician of the past (in red) should be interpreted as follows: Ion C. Brătianu's was interested more on Romanian specific aspects (the classes nationalism and people) uttered in an emotional tone (the class positive_emotional) than Crin Antonescu, whose discourse had an argumentative (the class rational) attitude, being also very much centred on labour aspects (the class work)
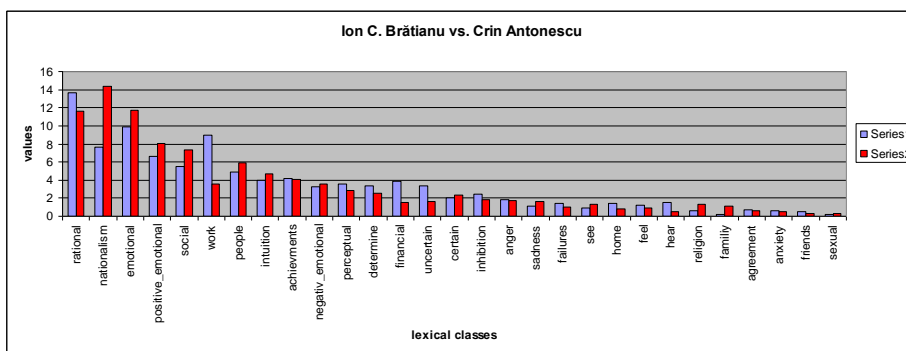

Fig. 1. *The average differences in the frequencies for each class after processing political discourses, between Ion C. Brătianu and Crin Antonescu.*

5.3. THE SYNTACTIC ANALYSES

In order to proceed with the syntactic analysis, the text bodies were annotated with syntactic information, in XML. Two sources of information have been used, involving manual and automatic annotation. Table 1 shows the corpus of documents annotated for syntax.

Political discourse	Number of units	Number of words	Number of units manually annotated	Number of units automatically annotated
Ion. C. Brătianu	869	20 844	200	669
Crin Antonescu	679	20 614	200	479

Table 1: *The collection of annotated texts*

The manually annotated treebanks (200 units for each political actor monitored) included the syntactic relations detailed in Table 2, with the respective frequencies.

We concentrated our analysis on three types of syntactic relations that we believe have an influential role in an electoral context, from a rhetorical-discursive point of view: adjectival, appositional and anacoluthic[14] (values in grey in the table). Note that these relations are not compulsory in the syntax of the phrase (as is the overtly expressed subject, for instance), and therefore, their use is strictly a matter of personal choice. As the values show, there is an obvious resemblance between the two speakers with respect to the use of these relations.

Syntactic type of relation (abrev.)	Ion C. Brătianu 1859		Crin Antonescu 2009	
	Number	*Percentage*	*Number*	*Percentage*
coord.	1040	13,1%	730	8,8%
prep.	910	11,5%	840	10,1%
a.adj.	680	**8,6%**	600	**7,2%**
c.d.	680	8,61%	840	10,1%
punct.	630	7,9%	880	10,6%
sbj.	590	7,4%	440	5,3%
part.	530	6,7%	640	7,7%
c.i.	430	5,4%	240	2,9%
a.subst.	360	4,5%	400	4,8%
a.vb.	310	3,9%	200	2,4%
det.	300	3,8%	360	4,3%
c.c.m.	240	3,0%	560	6,7%
n.pred.	170	2,1%	120	1,4%
aux.	140	1,7%	160	1,9%
a.adv.	120	1,5%	80	0,9%
refl.	120	1,5%	240	2,9%
anacol.	115	**1,4%**	95	**1,1%**
c.c.t.	90	1,1%	80	0,9%
neg.	90	1,1%	160	1,9%
ap.	85	**1,0%**	80	**0,9%**
c.c.l.	80	1,0%	120	1,4%
comp.	50	0,6%	80	0,9%
c.c.scop.	40	0,5%	120	1,4%
Total	7900	100,00%	8275	100,00%

Table 2 *Occurrence of dependency relations for political speeches corresponding to the two electoral contexts*

- The adjectival structure (8.6% – at the first author, 7.2% – at the second).

In terms of a rhetorical interpretation, the adjectives add colour to the discourse.

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[14] "Enunţul" (The statement), in *Gramatica limbii române* (Romanian Grammar), II, Academiei Române Publishing House, Bucharest, 2005, pp. 105-113, 619-31, 743-747.

They not only that bring a contextual, albeit new, information, but enhance the enounce by detailing it and developing it. The adjectival group is part of the rheme, not the theme, being placed (in Romanian) usually after the theme element. When it is placed in the thematic position it's role is emphatic, usually associated with a particular tone, but, generally, it does not change the content of the message. The relation reveals a certain taste for belletrist culture of the authors.
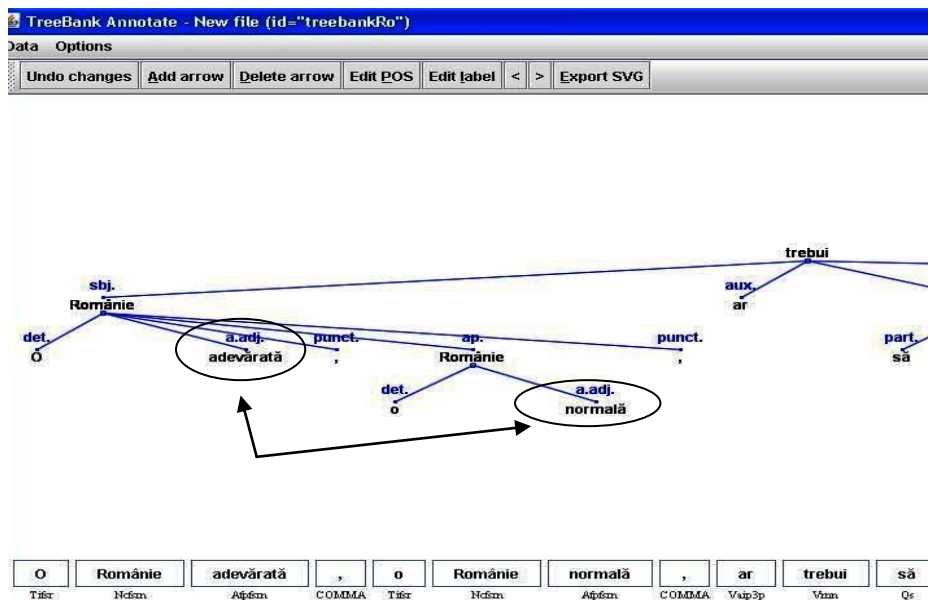

Fig. 2 *An adjectival structure on a dependency tree viewed with TreeAnnotator*

In Figure 2 the arrows highlight the presence of two adjectival structures: *Românie adevărată* (Real Romania), *Românie normală* (Normal Romania).

- The apposition structure (1% – at first author, 0.9% – at the second)

This is a dependency relation which holds between two lexical sequences, called base and apposition (the apposition being open to an unlimited number of terms).

Although they have some common characteristics, the apposition structure should be delimited from the syntactic relations of subordination and coordination, because between the base and the apposition there is no syntactic hierarchy. In our dependency structures, the appositive term is represented attached to the base.
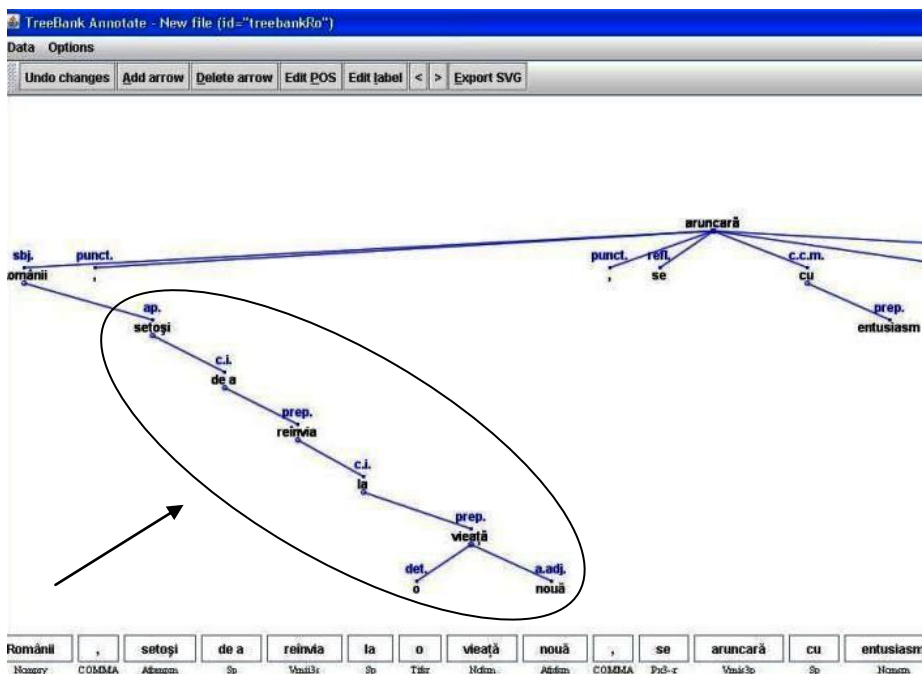
Fig. 3 *An apposition structure viewed with TreeAnnotator*

In Figure 3, the arrow highlights an apposition structure. The sentence "Românii se comportă cu entuziasm" (Romanians are enthusiastic) is interrupted by the apposition "setoşi de a reînvia la o viaţă nouă" (thirsty to attain a new life), which add contextual information to the main subject "Românii" (Romanians).

- The anacoluthic structure (1.4% – at the first author, 1.1% – at the second)

The anacoluthon marks an interruption of the syntactic construction (sentence, phrase). In general, the anacoluthon is considered an error in the grammar books. So, from a strictly literary syntax point of view it is forbidden. To evidence it automatically in texts is extremely difficult because it is rare and a parser need many occurrences to develop the ability to put it in evidence. In long sentences it is difficult even for an experienced annotator to note these intentional (or unintentional) errors, because the interspersed components have such diverse structures.

In the example in Figure 4, the principal sentence "După dânsul, veni mai târziu Regulamentul" (After him, the Regulation came later) is followed by the anacoluthon "căci el" (because it), which represents a suspended nominative (nominativus pendens) relation. The author feels the need for a change in the discourse theme, after upgrading the nominative "el" (it), which seems to have the function of subject near a predicate which was never uttered afterwards. The

experienced political actors use anacoluthic structures strategically in communication with the intend to focus the discourse or to highlight a particular element. In this example, the politician focuses on "Regulamentul" (the Regulation), and the subordinate concessive sentence "deşi fu impus de străini" (although having been imposed by foreigners).
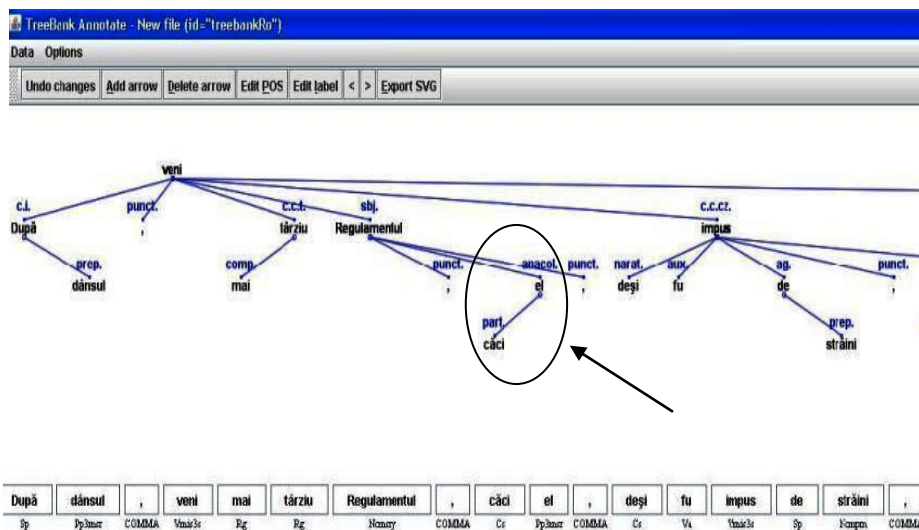

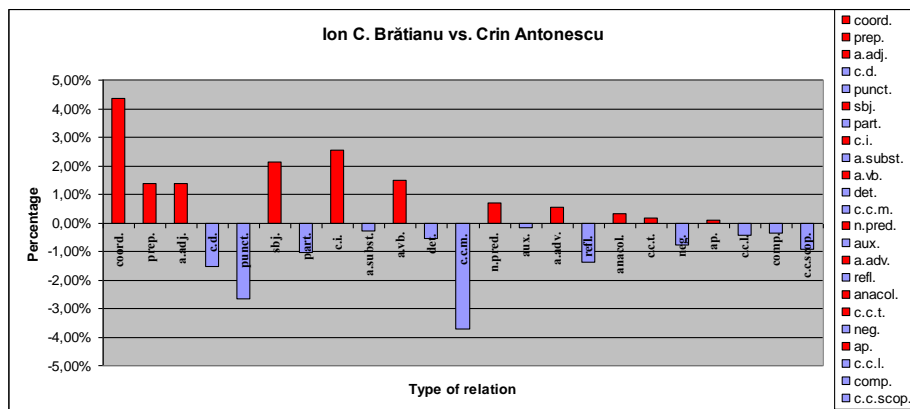**Fig. 4** *An anacoluthic structure viewed with TreeAnnotator*

Fig. 5 *Syntactic differences between Ion C. Brătianu and Crin Antonescu*

The quantitative representations of syntactic relations offered by the platform allow easy comparisons between different authors. For instance, the one in Figure 5 compares the politician under test (in blue) against the 19th century landmark politician (in red). The absolute values show that both subjects use extensively the coordination relation, a distinctive feature of two highly educated

politicians, with an impressive discursive experience, but the plot in Figure 5 reveals that Brătianu is much more prolific in this kind of relation than Antonescu. His sentences are rich in attributive relations (a.vb, a.adv.) and indirect complements (c.i.). Also, in a language in which the subject can be omitted (null pronoun) he explicitly mention the subject (a sign of emphasis). In opposition, Antonescu uses short sentences (punct.), rich in negations (neg.) and is focused on the how (c.c.m.) in order to sustain his argues.

Conclusions

It is clear that some of the differences at the level of lexicon and syntax which we have evidenced as differentiating the two political actors should be attributed only partially to idiosyncratic rhetorical styles, because they have also historic explanations. Moreover, speeches of many public actors, especially today, are the product of teams of specialists in communication and, as such, conclusions regarding their cultural universe, for instance, should be uttered with care. For instance, the lexical-semantic analysis of I. C. Brătianu should be put in the context of the troubled historic epoch of Romania during his time, and from here the tendency for nationalism and the exploitation of the emotional string. As exemplified, syntactic structures such as adjectival, appositional and anacoluthic seem to have powerful rhetorical values in the political discourse.

Different politicians could raise the use of these structures to the level of a rhetorical strategy, therefore exploiting them perhaps too much. In other words, we have now the technological means to detect tendencies of manipulation of the receiver with the evident role of detouring the attention of the audience from the actual communicated content in favour of the speaker.

Many interpretation facets are pertinent to the specific context a discourse is being uttered. For instance, in an election context a discourse should be evaluated in function of the balance between the public agenda versus the political candidate agenda. Different intensities of emotional levels could also be evidenced, and we prepare a more fined grade scale of emotional expressions. It is a known fact that the audience can be manipulated easily (e.g., the Sadness class) by journalists/political candidates when their themes are treated with excessive emotional tonalities.

We are aware that many technological aspects have yet to be refined and enhanced.

One of the most important is the determination of the senses of words and expressions in context. In the future we intend to include a word sense

disambiguation module in order to determine the correct senses, in context, of those words which are ambiguous between different semantic classes, or between classes in the lexicon and outside the lexicon (in which case they would not have to be counted). Also, negations could completely reverse the semantic class a certain expression belongs to in certain contexts and need therefore special treatment. The collection of manually annotated texts is only at beginning, a starting point for an efficient automatic annotation. In the near future we will manually correct all the automatically annotated texts, improving thus the behaviour of the parser. Another line to be continued regards the evaluation metrics, which have not received enough attention till now. We are currently studying other statistical metrics able to give a more comprehensive image on different facets of the political discourse.

We believe that the platform has a range of features that make it attractive as a tool to assist political campaigns. It can be rapidly adapted to new domains and to new languages, while its interface is user-friendly and offers a good range of functionalities. It helps to outline distinctive features which bring a new, and sometimes unexpected, vision upon the discursive characteristics of political authors or columnists

Bibliography:

1. Dijk, Teun A. van, *Textual Structures of News in the Press. Working notes*, University of Amsterdam, Department of General Literary Studies, Section of Discourse Studies, 1972.
2. Edelman, Murray, *The Symbolic Uses of Politics*, University of Illinois Press, Urbana, 1985. Originally published in 1964.
3. Fellbaum, Ch. (ed.), *WordNet, An Electronic Lexical Database*. The MIT Press, 2001.
4. Gîfu, D., & Cristea, D., "Computational Techniques in Political Language Processing: AnaDiP-2011," in J. J. Park, L. T. Yang, & C. Lee (Eds.), *FutureTech 2011,* Part II, CCIS 185, pp. 188-195, 2011.
5. Gîfu, D., *Violența simbolică în discursul electoral* (The Violence of Symbols in electoral discourse), Casa Cărții de Știință, Cluj-Napoca, 2010.
6. *** "Enunțul" (The statement), in *Gramatica limbii române* (Romanian Grammar), II, Academiei Române Publishing House, Bucharest, pp. 105-113, 619-31, 743-747, 2005.
7. Liddy, E. D., "Natural Language Processing," in *Encyclopedia of Library and Information Science*, 2nd Ed. NY. Marcel Decker, Inc., 2001.

8. Mann, W. C., & Thompson, S. A., "Rhetorical Structure Theory: Toward a functional theory of text organisation," *Text* 8(3), 1988, pp. 243-281.

9. Marinescu, G., and Grecescu, C. (ed.), "Ion C. Brătianu. Acte şi cuvântări" (Documents and speeches), pp. 228-237, vol. I – part I (june 1848 = december 1859), Cartea Românească, Bucharest, 1938.

10. Pennebaker, J. W., Francis, Martha E., & Booth, R. J., *Linquistic Inquiry and Word Count – LIWC2001*, Mahwah, NJ, Erlbaum Publishers, 2001.

11. Perlmutter, D. D., *The Manship School guide to political communication*, Baton Rouge, Louisiana State University Press, 1999.

12. Plett, Heinrich F., *Ştiinţa textului şi analiza de text* (The science of text and text analysis), Univers Publishing House, Bucharest, 1983.