Contrastive parallelism in European Portuguese
Prosodic features of a cohesion mechanism

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This paper focuses on the encoding of contrast in European Portuguese (EP), specifically by analysing contrastive parallelism structures, which seem to be crucial in the construction of the type of discourse that will be analysed: the argumentative discourse. Hence, my main goal is discussing how contrast is prosodically encoded in these structures and to relate the results with previous ones for other languages. The data show that contrastive parallelism has specific acoustic properties and that there is no one-to-one relation between pitch accents and these structures. Therefore, the results seem to indicate that the prosodic encoding of such structures is gradient.

1. Introduction

The study of the prosodic encoding of contrast entails two important theoretical issues that will guide this paper. On the one hand, literature has been discussing whether the prosodic encoding of contrast is gradient or categorical and, on the other hand, whether there are, or not, universals in the prosodic encoding of contrast. Furthermore, the fact that contrast studies are often centred on the analysis of focus and topic structures points out the relevance of interface studies involving prosody, syntax, semantics, and discourse in achieving a better understanding of contrast and its linguistic marking.

In this paper, I focus my attention on parallelism structures that convey contrast – or contrastive parallelism, as they will be named from now on. The reason for this choice is related to the type of discourse analysed in this work, i.e., argumentative discourse and, more specifically, a political debate. By analysing a political debate, it became clear that parallelism structures are widely used as a cohesion mechanism in such a type of discourse and, what is more, contrastive parallelism is associated with crucial moments of the argumentation and counter-argumentation of each debater.

Taking these aspects into account, the following sections will be centred on the analysis of contrastive parallelism structures, considering, first of all, the role of these structures as a cohesion mechanism and, secondly, the nature of the prosodic encoding of the semantic--discoursive value of contrast. The type of analysis conducted is, thus, guided by three main research questions:

(i) Which prosodic features are associated with structures of contrastive parallelism?

(ii) Is the prosodic encoding of contrastive parallelism gradient or categorical?

(iii) What is the role of contrastive parallelism in the syntax/prosody mapping? Does it have an effect on the melody and phrasing of utterances?

This paper is organized as follows: in section 2, previous studies on parallelism and on contrast are presented; in section 3, the corpus and the annotation criteria are explained; in section 4, the data are described; in section 5, the results are discussed in light of the initial research questions; and, finally, in section 6, a conclusion and some final remarks are made.

2. Theoretical background
2.1. Parallelism as a cohesion mechanism

Often taken as a rhetorical device, parallelism is also, and more importantly, referred to as a cohesion mechanism in early works on textual cohesion, such as Halliday & Hasan (1976). Taking this perspective into account, parallelism can be defined, from a discourse/syntax perspective, as a cohesion mechanism that entails the interface between different grammar components (e.g., syntax, semantics, morphology, phonology) and that involves shared grammatical features, similar word order, and similar syntactic structure, as proposed by Duarte (2003). Furthermore, the author emphasizes other important features of parallelism that evidence the interface of parallelism with other cohesion mechanisms in the construction of a textual unit. In this context, Duarte (2003) mentions, for instance, that lexical cohesion plays an important role in structural parallelism, since the latter can often be associated with strategies like word repetition or the presence of semantic relations.

From a prosodic point of view, parallelism is essentially described as a mechanism of tonal copy or, in other words, as intonational parallelism. Moreover, intonational parallelism is traditionally defined as tonal copy between consecutive intonational units. It is also worth noting that the study of intonational parallelism does not usually focus on constructions of structural parallelism. In fact, the studies of authors such as Palmer (1922), Crystal (1969), and Fox (1984) have in common the fact that the analysis of intonational parallelism is exclusively phonological and that, consequently, exploring the relations between syntactic structure and prosodic structure regarding parallelism is avoided. Nevertheless, it can be observed that, in works like Palmer (1922), Crystal (1969), or Fox (1984), tonal copy was generally analysed in structures of coordination, subordination, and parentheticals, for example. In this context, the main purpose of the prosodic analysis was to identify specific intonational contours that could be involved in intonational parallelism.

On the contrary, subsequent studies (Bolinger 1989; Wichmann 2000) show a new perspective by ascribing a cohesive function to intonational parallelism. Crucially, Bolinger (1989) points out that the repetition of intonational contours is what gives intonational parallelism (or "series intonation", in the author's words) its cohesive function and, for this reason, it is more relevant than the specific type of intonational contour that is copied.

> *What is probably more important as a general feature of series intonation is not the particular profile used on any one item (…) but the repetition of the same profile. This is a cohesive device in discourse (…).* (Bolinger 1989:207)

The type of intonational contour, along with its repetition, can be motivated by its discursive function or meaning, the author argues. On this matter, three main aspects should be mentioned: firstly, tonal copy can be seen as an insistent way of associating a specific communicative intention to an utterance; secondly, the repetition of an intonational contour

characterized by "an abrupt fall *in* or *from* the syllable that is made to stand out by the fall" (Bolinger 1989:3) can be associated with emphasis by giving a "dramatic or authorative effect" (Bolinger 1989:208) to a sequence, for instance; and, lastly, an emphatic realization of conjunctions (e.g., *and*, *or*), creates more tension (since conjunctions are elements not frequently accentuated in other contexts) and, consequently, draws the attention of the hearer.

More recently, Wichmann (2000) presented important findings on this matter. The author analysed data from the Spoken English Corpus (Knowles et al. 1996) and found intonational parallelisms involving consecutive nuclear pitch accents, as has been traditionally described, but also found two new contexts of tonal copy: (i) intonational parallelism involving different tones and (ii) intonational parallelism between non-consecutive tonal units. Regarding the first context, Wichmann (2000) argues that intonational parallelism can be perceived between different tones if we consider not their phonological categories, but their phonetic properties instead. As the author explains, the tones L* H and H* H, for instance, can be perceived as parallel because, phonetically, they are both realized with a final rising movement. On the other hand, the possibility of intonational parallelism between non-consecutive tonal units can be motivated by phrasing. As the author explains by taking a list as an example, if each list item does not correspond to a single tonal unit, we can still find tonal copy, although not between consecutive nuclear pitch accents.

2.2. Contrast encoding

Over the past few years, there has been a growing debate about the prosodic realization of contrast. On this matter, it is important to note, first of all, that contrast is often studied in relation to structures of topic and focus and that in this context it can have different meanings: contrast can be defined in the literature as a category, a subtype of focus or topic, or as a semantic-discoursive value associated with topic and focus structures, which is the view adopted in this paper.

Regarding the prosodic encoding of contrast, studies for different languages have been presenting data in favour of a gradient or categorical prosodic encoding of contrast. Thus, for authors as Steedman (2000) and Büring (2003), the realization of contrastive focus and topic corresponds obligatorily to a specific intonational contour. In fact, Büring (2003) argues that the definition of contrastive focus and of contrastive topic should be based on their prosodic realization. Hence the author, following Jackendoff (1972), defines the first one as a linguistic category realized in English by a falling pitch accent, the "A-accent", and the latter by a falling-rising pitch accent, the "B-accent" (Büring 2003:512).

On the contrary, Féry (2007) and Féry & Krifka (2008) propose that there is no one-to--one relation between intonation and contrast. Opposite to what is defended by Büring (2003), Féry (2007) claims that topic, focus, and contrast are not phonological concepts, rather their phonetic and phonologic properties can be cues to their interpretation. Nevertheless, the author claims that some specific intonational contours can be preferentially associated with structures that convey contrast, such as contrastive foci or contrastive topics. This preferential relation, the author notes, should not be associated with the information status of this type of structures, but with their syntactic distribution patterns.

Regarding the hypothesis of a gradient prosodic encoding of contrast, several recent studies for different languages have presented data supporting this claim. For German, Braun & Ladd (2003) and Braun (2006) compared the prosodic features of contrastive and non-contrastive topics in initial sentence position and found significant differences between

contrastive and non-contrastive contexts, especially regarding phonetic correlates. Hence, the authors conclude that contrastive topics show: (i) a longer duration of the stressed vowel; (ii) a higher and longer f_0 rise; (iii) higher values of f_0 range; (iv) higher values of f_0 peak height; and (v) later f_0 peak alignment. In addition, Braun & Ladd (2003) point out that there is some degree of variation in contrast marking, since speakers can use different strategies in order to mark contrast (e.g., their data reveal that some speakers use preferentially f_0 range, while others use f_0 peak alignment). Importantly, this variation within and across speakers is taken as another argument in favour of the gradient marking of contrastive topics.

Also for German, but regarding focus structures, Baumann et al. (2006) discuss the role of categorical and gradient features in contrast marking to conclude that speakers use both. According to the findings described in this study, broad focus and narrow focus (with contrastive focus being included in the latter) differ by the presence of the pitch accent !H* in over 50% of the cases of broad focus and, crucially, by the complete absence of the same pitch accent in contrastive focus. Moreover, similar phonetic properties as the ones highlighted by Braun & Ladd (2003) were also found as the focus domain narrows, namely a longer duration of the focalized elements, a higher f_0 peak associated with the nuclear accent, a greater pitch excursion to the peak of the nuclear accent, and, finally, a delay in the nuclear accent peak (Baumann et al. 2006:303).

For Italian, parallel results are described for contrastive foci by Torregrossa (2012). In this interface study between syntax and prosody, the author argues that contrast defines a set of alternatives of the same semantic type of the constituent it is associated with and, crucially, it is an autonomous informational notion with its own semantic content. Following this assumption and based on the results found for Italian, Torregrossa (2012) argues that contrast is not syntactically encoded as a specific functional projection. The prosodic results, on the other hand, exhibit a gradient marking of contrast, since they allow highlighting the role of longer duration and higher values of f_0 range measured in focalized elements, as opposed to the fact that contrast does not seem to have a direct effect neither on phrasing nor on intonational contours.

Finally, Borràs-Comes et al. (2010) propose an analysis of the prosodic features of statements, contrastive foci, and echo questions in Catalan. Since the nuclear pitch accent L+H* is associated with the three types of structures analysed in this study, the authors intend to find out whether f_0 differences are determinant in disambiguation, since it is assumed that increasingly higher values of f_0 are associated with each of the three semantic values. Crucially, the data lead the authors to conclude that f_0 range and f_0 peak height are determining features and, therefore, that there is a gradient distinction between statements and contrastive foci. Moreover, Borràs-Comes et al. (2010) also found variation across speakers in contrast marking and, in line with previous studies (e.g., Braun & Ladd 2003), take this finding as an argument in favour of the gradient nature of contrast.

Additionally, it is also important to mention, as Ladd (2008) has noted, that emphasis can play a relevant role in contrast marking as well. As the author puts it, emphasis can be seen as a "paralinguistic possibility of gradiently modifying the realization so as to single out individual words" (Ladd 2008:256). As for the phonetic features associated with emphasis, Ladd (2008) and Ladd & Morton (1997) point out that, in English, higher values of energy and of f_0 range are associated with emphasis. Furthermore, the authors claim that the perception of emphasis is gradient, being related to acoustic differences and, especially, to variation in f_0 range, but that the interpretation of emphasis is categorical, since an utterance is classified by hearers either as "normal" or "emphatic".

For European Portuguese (henceforth EP), although there are no studies specifically about contrastive parallelism, some literature has discussed the prosodic features related with contrast. Viana (1987), for instance, analysed foci structures and argues that focalized elements are realized by a "height accent" (Viana 1987:87) that affects the f_0 peak's height (aligned with the stressed vowel of the focalized word), which, in turn, affects the range of f_0 that precedes and follows the f_0 peak. Nevertheless, the author notes that within and across speaker variation and the distribution of the focalized element in the sentence may influence its prosodic realization.

In a more recent study, Frota (2000), on the other hand, argues in favour of a categorical realization of focus, which reflects on prominence and intonational patterns. Hence, the focalized element is the more prominent, regardless of its position in the sentence, and it is always associated with the pitch accents H*+L or ^H*+L. As far as the phonetic properties of focus are concerned, the author argues that the values of the f_0 peak's height and of the range of f_0 are related to emphasis, which is understood as a gradient and optional element that should not be taken into account in a phonological and categorical definition of focus.

Lastly, Viana et al. (2007), besides reaffirming that H*+L and ^H*+L are associated with focus, present data that allow the authors to say that the pitch accents H* and L+H* convey new information and are associated with emphasis as well. Finally, the pitch accent ^H* was found in contexts of emphasis and specification or correction of given information.

3. Methodology

The present study is based on a corpus built from a political debate aired by the public radio and television broadcaster of Portugal (RTP) on November 6th, 1975. This political debate was carried out by the two candidates to Prime Minister of Portugal at the time: Álvaro Cunhal (AC) and Mário Soares (MS). The main reason why this debate was chosen is related to its unique characteristics. First of all, it represents an historical moment, since it was decisive to the result of the first democratic elections after the end of a long period of dictatorship. Secondly, and perhaps more importantly, the quality of the debate has been acknowledged by previous studies on political science and media studies (e.g., Sena 2002). On this matter, Sena (2002) praises the quality of this debate by pointing out that both opponents' speech is characterized by a rational argumentation, aiming at enlightening the viewers, and by the absence of verbal attacks. What is more, these same characteristics can be seen as positive and, consequently, as vital in a quality argumentative speech, as argued in Dolz & Schneuwly (1998).

The debate lasted 3:31'07" and, besides the presence of the two political leaders, the debate was moderated by the journalists José Carlos Megre and Joaquim Letria, although only the speech of AC and MS was considered for analysis (3:18'10''). It is also important to note that the speech time of AC and MS was balanced: AC had a total of 1:38'01" speech time and MS a total of 1:40'09".

Regarding the transcription and alignment of the corpus, the debate was previously converted from video format (*Video OBject*) to audio format (*WAVEform audio format*) and the transcription (based on the transcription published in the newspaper *Diário de Lisboa* on November 8th, 1975 edition) was aligned with the acoustic signal using *Transcriber* (Barras et al. 1998).

Considering the target structures of this study, first of all it was necessary to make a survey of the relevance of parallelism in the corpus. In order to do so, all parallelisms were identified

and annotated according to a typology involving six categories (cf. Table 1).[1] As a result of this task, a total of 391 parallelism structures were identified in the corpus: 244 produced by AC and 147 produced by MS.

Typology of Parallelism Structures
Construction parallelism: refers to parallels in syntactic structures, such as clauses and phrases.
Lexical parallelism: refers to lexical repetition, which includes lexicon reiteration and lexical scales. The latter involves the use of lexical choices which lead to an increasing or decreasing strength effect, thus creating a scale.
Temporal parallelism: refers to verb forms that share verbal features such as tense, aspect, person, and number.
Semantic parallelism: refers to semantic relations like whole-to-part, hierarchies and similarities/oppositions.
Rhyme parallelism: refers to phonological phenomena, such as rhymes and alliterations.
Prosodic parallelism: Following Bolinger (1989) and Wichmann (2000), this refers to a cohesion mechanism associated mainly with tonal copy. It should be noted that there are various mechanisms that can ensure its perception (as discussed in section 2.1. of this paper).

Table 1: Typology of parallelism structures.

A closer observation of the data allowed identifying a subtype of construction parallelism that seems relevant in argumentative discourse, since it is found in crucial moments of the argumentation and counter-argumentation of both debaters. This specific type of construction parallelism is defined as a structure in which parallel grammatical structures express a proposition that denies or restricts the truth-value of another proposition in the same "contextual set" (Stalnaker 1978; Reinhart 1982). Hence, from now on, this specific type of structure will be called contrastive parallelism (cf. examples (1) and (2), realized by Mário Soares and Álvaro Cunhal, respectively. The contrastive parallelism structures are italicized).

(1) Ora, o Partido Socialista já escolheu o seu campo desde sempre. O Partido Socialista é um partido de esquerda, quer instaurar em Portugal uma sociedade socialista, portanto, uma sociedade sem classes, *mas em liberdade, mas respeitando os direitos do homem, mas através da democracia e do consenso popular majoritário, não fará uma revolução, nem irá para um socialismo que transforme este País numa ditadura.* (MS) 'Now, the Socialist Party has chosen which side is it on from the beginning. The Socialist Party is a left-wing party, it wants to establish a socialist society in Portugal, therefore, a society without classes, *but in freedom, but respecting the human rights, but through democracy and the majority popular consensus, it will not do a revolution, nor will it choose a socialism that turns this country into a dictatorship.*' (MS)[2]

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[1] In order for an utterance be considered a parallelism it had to have features of, at least, one of the six types of parallelism described in Table 1. Nevertheless, in most cases, the parallelism structures contained features from more than one type of parallelism, and were classified accordingly. For instance, example (1) shows marks of construction, lexical, and prosodic parallelism.

[2] The translations presented for each example from the corpus are intended to convey the general meaning of the utterance, i.e., they are not word by word translations. Nevertheless, the translation of the contrastive parallelism structures was made in such a way that all the parallelism features and the conjunctions or connectors with a contrastive meaning are preserved in the target language.

(2) Mas, dizia eu, que quanto a eleições*, nós queremos eleições e queremos sufrágio universal, mas queremos, em primeiro lugar, restabelecer as liberdades em todo o território nacional.* (AC)

  'But, as I was saying, in what regards elections, *we want elections and we want universal suffrage, but we want, firstly, to re-establish freedom in all national territory*.' (AC)

A total of 47 cases of contrastive parallelism were found in the corpus (37 produced by AC and 10 by MS). In the analysis of each structure, the whole utterance (i.e., the contrastive parallelism structure itself and the context) was considered in order to ensure its correct interpretation. For this reason, the length of the analysed utterances varies between 3.2 seconds, for the shorter utterance, and 50.5 seconds, for the longest utterance.

After identifying the cases of contrastive parallelism, it was considered relevant to annotate the major and minor intonational phrases in all the 47 utterances with contrastive parallelism structures, since the intonational phrase would be the work unit from which several annotation parameters would be drawn from.[3] The result was a total of 1097 major and minor intonational phrases (789 of AC and 308 of MS). From this total, a sample was selected for prosodic analysis. In this selection process, the intonational phrases were classified according to their function in the utterance. Hence, two types of prosodic constituents were considered: the target constituents (T), which are intonational phrases that contain the contrastive parallelism structures, and the context constituents (C), which are intonational phrases that are found in the same utterance and are a part of the structure's "contextual set". Furthermore, a third type of constituent was retrieved from the corpus, namely intonational phrases extracted from neutral declarative sentences (simple or complex), without neither marked word order nor associated with an emphatic prosodic realization. These prosodic constituents were classified as control constituents (Ctrl) and were compared with the context constituents and, especially, with the target constituents.

Type of Constituent	Speaker		
	AC	MS	Total
T	115 (28.4%)	116 (28.6%)	231 (57%)
C	46 (11.4%)	53 (13.1%)	99 (24.4%)
Ctrl	38 (9.4%)	37 (9.1%)	75 (18.5%)
Total	199 (49.1%)	206 (50.9%)	405 (100%)

Table 2: Prosodic constituents selected for analysis.

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[3] On this matter, I follow works such as Frota (2000) and Viana et al. (2007) which consider that, in the case of EP, there are two levels of intonational phrasing, the minor and the major intonational phrase.

The prosodic and intonational literature on SEP has differentiated two levels of intonational phrasing and equated both of them to the IP (intonational phrase) type: the major IP (or compound IP) and the minor IP (Frota 2000, extending ideas from Ladd 1992, 1996). These two levels show boundaries of different strength: the major IP boundary (which is the outer boundary) shows a wider pitch range and bigger final lengthening than the minor IP boundary (which is the inner boundary within the compound IP phrase). (Viana et al. 2007).

Lastly, all of the 405 major and minor intonational phrases (cf. Table 2) was prosodically annotated in *Praat* (Boersma & Weenink 2009), following the conventions of *Towards a P_ToBI* (Viana et al. 2007). Each *Praat* file is composed of: (i) a word tier, with the orthographic transcription; (ii) a break index tier, with the annotation of break indices of levels 3 and 4, which correspond to minor and major intonational phrases, respectively; and (iii) a tone tier, where the pre-nuclear and nuclear pitch accents, as well as the boundary tones, were annotated. The annotation of each intonational phrase also included global and local phonetic measures. Concerning the local measures, the f_0 values (in semitones (ST)) of high and low targets of pre-nuclear and nuclear pitch accents and also of boundary tones were extracted. As for the global measures, duration (in seconds), number of syllables (phonological), maximum and minimum of energy (in decibels), and maximum, minimum, and range of f_0 (in ST) were extracted from each intonational phrase.

Regarding pitch accents and boundary tones, the annotation adopted the tonal inventory described for EP, in works such as Frota (2000, *in press*) and Viana et al. (2007), and took into account that the nuclear contours described for EP are, in general, equally found in minor and major intonational phrases (Viana et al. 2007). Particularly in the case of boundary tones, the notation "X" and "g" (preceding the tags H or L) was adopted, as proposed in Viana et al. (1999), where "X" indicates a major or minor intonational phrase boundary that corresponds to an oxytone word and "g" indicates a boundary that corresponds to post-tonic voicelessness or cases in which fundamental frequency is not detected.

Finally, it is worth mentioning that the data collected from the prosodic annotation were statistically analysed using SPSS (Statistical Package for the Social Sciences), version 18.0.0. Regarding acoustic measures, mean values were calculated and ANOVA (*F*) and t-Test (*t*) for independent samples were applied in the cases where the normality (and in the case of ANOVA also homogeneity) of variances was proven. In all other cases, Mann-Whitney (*U*) (for two independent samples) and Kruskal-Wallis (*H*) (for more than two independent samples) tests were performed. In the case of break indices and intonational contours, crosstabs and Chi-square (χ^2) tests were performed.

4. Data analysis[4]

The statistical analysis conducted on the data supports the existence of correlations between the type of structures and the prosodic parameters considered in this study and it also shows that there are differences between both speakers in several of the parameters. Over the next sections, the results obtained for acoustic measures and intonation are presented.

4.1. Acoustic measures

Regarding the acoustic measures taken into account in this study, the statistical analysis shows that there are significant differences between the two speakers in many of the parameters. Concerning global measures, this is true for duration ($U = 17865$, $p = .025$), number of syllables ($U = 13108$, $p < .001$), energy maximum ($U = 14509$, $p < .001$), f_0 maximum ($U = 17078$, $p = .004$), and f_0 minimum ($U = 15709$, $p < .001$). In the case of local measures, f_0 maximum of the pre-nuclear pitch accents ($U = 2314$, $p < .001$), f_0 minimum of

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[4] For a more detailed description of the data presented in this section, as well as for consulting tables and graphics concerning all the phonetic and phonological parameters discussed, see Cardoso (2012).

the pre-nuclear pitch accents ($U = 2484$, $p = .001$), and f_0 maximum of the nuclear pitch accents ($U = 17422$, $p = .009$) also present similar results.

Now, considering the possible correlation between phonetic features and the three types of constituents analysed – T, C, and Ctrl –, it was also found that, in many cases, there is in fact a correlation and, what is more, two patterns emerge from the statistical analysis.

Thus, the first pattern involves duration and number of syllables and the results obtained for these parameters reveal significant differences between constituents T and C (duration: ($U = 8957.5$, $p = .002$), number of syllables: ($U = 9388.5$, $p = .010$)) and also between C and Ctrl (duration: ($U = 2341$, $p < .001$), number of syllables: ($U = 2600$, $p = .001$)). These results point to the fact that duration and number of syllables have similar values for T and Ctrl (cf. Table 3).

Duration (seconds)			Number of Syllables		
Type of Constituent	Speaker		Type of Constituent	Speaker	
	AC	MS		AC	MS
T	0.894	0.751	T	7.28	4.70
C	0.985	0.963	C	8.46	6.13
Ctrl	0.707	0.737	Ctrl	5.53	4.81

Table 3: Mean values of duration and number of syllables.

The results obtained for the energy and f_0 parameters, on the other hand, show a different pattern from the one described for duration and number of syllables. Focussing firstly on the statistical results for global measures, significant differences exist between T and Ctrl and also between C and Ctrl in energy maximum (T and Ctrl ($U = 6386$, $p = .001$); C and Ctrl ($U = 2660$, $p = .001$)); in f_0 maximum (T and Ctrl ($U = 3149$, $p < .001$), C and Ctrl ($U = 1114$, $p < .001$)); and in f_0 minimum (T and Ctrl ($U = 4910$, $p < .001$), C and Ctrl ($U = 2478$, $p < .001$). Also relevant is the fact that f_0 range is the only parameter showing differences between all three types of constituents (T and Ctrl ($U = 6289$, $p < .001$), C and Ctrl ($U = 2012$, $p < .001$), and T and C ($U = 9420$, $p = .011$)).

As can be seen by the results described so far, the energy and f_0 parameters that show a correlation between types of constituent and prosodic features point to a pattern that opposes Ctrl to T and C (see an example in Figure 1).
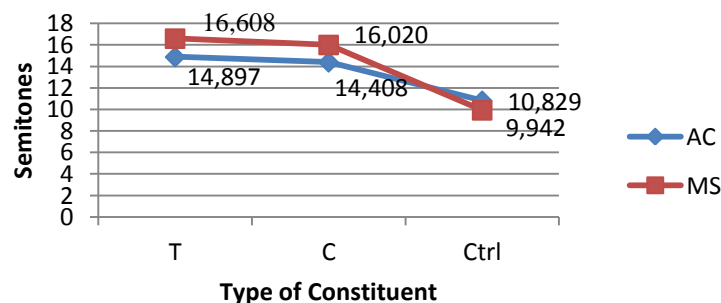

Figure 1: f_0 maximum – mean values.

Even in the case of f_0 range, the only parameter that presents significant differences between the three types of constituents, the values of T and C are closer, when compared with the values of Ctrl (as Figure 2 shows).
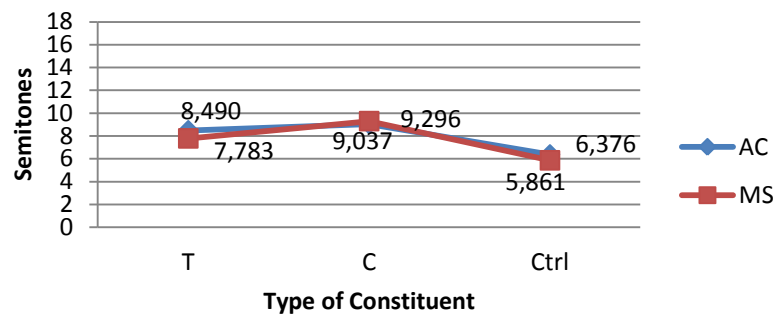

Figure 2: f_0 range – mean values.

The statistical data of the local measures seem to corroborate this (see examples in Figures 3, 4, and 5), since significant differences were found, once again, between constituents T and Ctrl in all the analysed parameters: f_0 maximum of the pre-nuclear pitch accents ($U = 208$, $p < .001$) and f_0 minimum of the pre-nuclear pitch accents ($U = 285$, $p = .004$); f_0 maximum of the nuclear pitch accents ($U = 4281$, $p < .001$) and f_0 minimum of the nuclear pitch accents ($U = 5113.5$, $p < .001$); and f_0 maximum of the boundary tones ($U = 720$, $p < .001$) and f_0 minimum of the boundary tones ($F (2, 160) = 4.985$, $p = .014$). Moreover, there are also significant differences between C and Ctrl in f_0 maximum *($U =82$, $p < .001$)* of the pre-nuclear pitch accents and f_0 maximum ($U =1385$, $p < .001$) and minimum ($U = 1876$, $p < .001$) of the nuclear pitch accents.
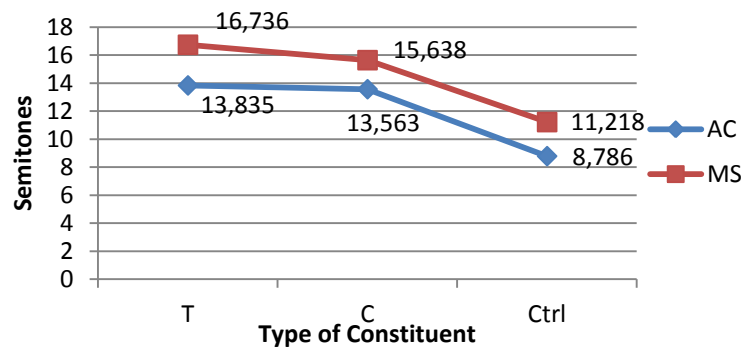

Figure 3: f_0 maximum of pre-nuclear pitch accent – mean values.

Furthermore, each of the local measures that were analysed replicate the exact same pattern: the constituents T have the higher values, followed by constituents C and, lastly, constituents Ctrl have the lowest values, even though in some cases (e.g., mean values of the f_0 maximum of the nuclear pitch accent) the values of T and C are quite close. This aspect is exemplified by Figure 3 and also by Figures 4 and 5.
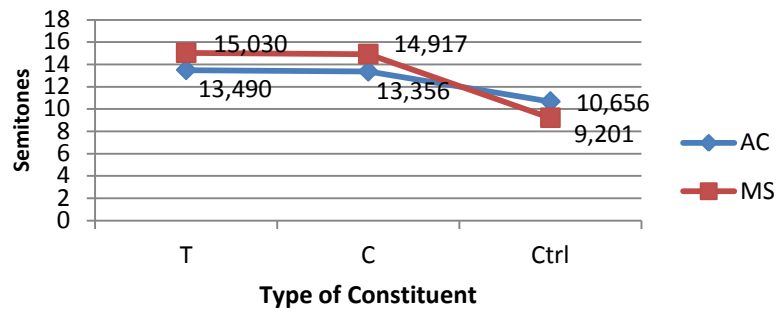
Figure 4: f₀ maximum of the nuclear pitch accent – mean values.
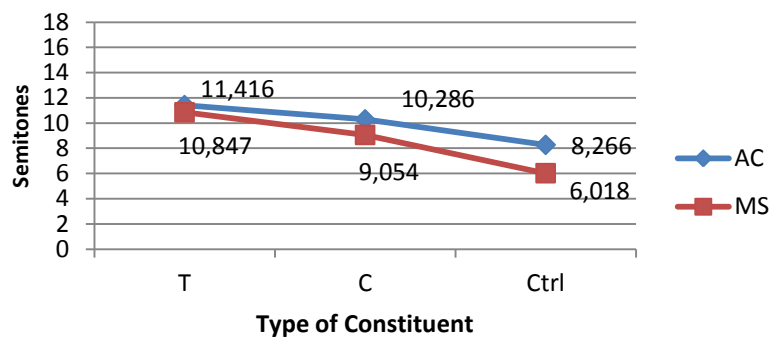

Figure 5: f₀ maximum of the boundary tone – mean values.

Thus, the results obtained indicate a predominant pattern that distances C from Ctrl and, even more importantly, T from Ctrl. Nevertheless, it should also be taken into account that significant differences are not always found between C and Ctrl and especially that significant differences are seldom found between T and C. This observation, along with the fact that constituents C often show intermediate values (although closer to the ones found in T), points to the existence of a continuum in the values of the three types of constituents across the different phonetic measures analysed. Therefore, we can say that there is a dominant pattern that distances T and Ctrl and places C between the former two.

4.2. Intonation

Regarding pitch accents and boundary tones, significant differences between speakers were found in nuclear pitch accents ($\chi2$ (1) = 9.332, p = .009) and boundary tones ($\chi2$ (2) = 10.258, p = .001).

On the other hand, the comparison of the results by type of constituent reveals that only pre-nuclear pitch accents show a significant correlation between the distribution of pitch accents and the type of constituent. Remarkably, the results obtained for pre-nuclear pitch accents present the same pattern found in the f_0 and energy parameters. In other words, the pre-nuclear accents show significant differences between T and Ctrl ($\chi2$ (1) = 6.647, p = .016) and between C and Ctrl ($\chi2$ (1) = 6.025, p = .029).

	H*	^H*	L+H*	L+^H*	H*+L	^H*+L	H+L*	L*	N (%)
T	45	9	10	5	12	-	21	8	110 (64)
C	17	1	10	7	1	2	10	3	51 (29.7)
Ctrl	3	-	-	-	1	-	4	3	11 (6.3)
N (%)	65 (37.8)	10 (5.8)	20 (11.6)	12 (7)	14 (8.1)	2 (1.2)	35 (20.3)	14 (8.2)	172 (100)

Table 4: Pre-nuclear pitch accents' distribution by type of constituent.

Besides the statistical results, it should be highlighted that, crucially, pitch accents ^H*, L+H*, L+^H*, and ^H*+L do not occur in Ctrl (cf. Table 4). Nevertheless, we can say that there is no one-to-one relation between pitch accents and types of constituent, since seven different pitch accents were found associated with T constituents, for example. Thus, and more importantly, the data seem to show that there is no phonological category specifically associated with T, or, in other words, with the constituents that convey contrast.

As for nuclear accents and boundary tones, it is important to recall that only differences across speakers were found, and not across different types of constituent, which reinforces the previous observation of the absence of a one-to-one relation between pitch accents and types of constituent.

	H*	^H*	L+H*	L+^H*	H*+L	^H*+L	!H*	L*+H	H+L*	L*	N (%)
T	43	6	71	16	12	3	5	1	48	26	231 (57)
C	19	3	30	3	10	1	1	-	25	7	99 (24.4)
Ctrl	20	-	18	-	5	-	-	-	17	15	75 (18.6)
N (%)	82 (20.2)	9 (2.2)	119 (29.4)	19 (4.7)	27 (6.7)	4 (1)	6 (1.5)	1 (0.2)	90 (22.2)	48 (11.9)	405 (100)

Table 5: Nuclear pitch accents' distribution by type of constituent.

Furthermore, there is some degree of variety in pitch accents that were found in nuclear position in all three types of constituents (cf. Table 5). However, once again, we can see that some pitch accents do not occur specifically in Ctrl constituents in nuclear position. This is the case of ^H*, L+^H*, ^H*+L, and !H*. In light of these results, it can be said that the pitch accents that occur in T, but not in Ctrl, are pitch accents with high targets aligned with the stressed syllable. Moreover, we are talking, in many cases, of pitch accents that can be associated with higher levels of f_0 (e.g., ^H*, L+^H*, and ^H*+L).

Finally, the distribution of boundary tones shows that there is a higher frequency of low boundary tones in every type of constituent. Nevertheless, it should be noted that, in proportion, there is a higher frequency of high boundary tones in T (102 out of 231, which corresponds to 44.2%) (cf. Table 6).

	H- / H%	**L- / L%**	**HL- / HL%**	N (%)
T	102	119	10	231 (57)
C	34	57	8	99 (24.4)
Ctrl	25	49	1	75 (18.6)
N (%)	161 (39.7)	225 (55.6)	19 (4.7)	405 (100)

Table 6: Boundary tones distribution by type of constituent.

5. Discussion

Considering the results presented above, and focussing our attention firstly on duration and number of syllables, the results for these parameters do not seem to be conclusive. Nevertheless, it is worth trying to propose an explanation to the somewhat unexpected proximity of values between the constituents that form contrastive parallelism structures (T) and the ones retrieved from neutral statements (C). On this matter, lower values found in T may be related with a phrasing and prominence strategy aiming at emphasizing function words in contrastive parallelism structures, in line with what is argued by Bolinger (1989). In fact, throughout the cases of contrastive parallelism, there are many examples of conjunctions and connectors conveying negation and contrast (e.g., *mas* 'but', *pelo contrário* 'on the contrary', a.o.) that form an independent intonational phrase and that are realized with an emphatic intonation.

On the contrary, it seems that both global and local f_0 measures stand out in marking contrastive structures. Concerning f_0 measures, it is worth recalling that the data show that T, i.e., the constituents that contain the contrastive parallelism structures, has the highest values in almost all of the parameters analysed. What is more, and although there is an evident proximity between the values found in T and the ones found in C, the statistical analyses proves the existence of a significant difference between contrastive parallelism structures (T) and neutral statements (Ctrl) for each of the f_0 measures considered in this study. Hence, the prosodic encoding of contrast in contrastive parallelism structures shows a similarity to what has been stated for other languages (Braun & Ladd 2003; Baumann et al. 2006; Borràs-Comes et al. 2010; Torregrossa 2012). As previous studies showed, higher f_0 levels seem to be crucial in the prosodic marking of contrast and, as the results from the present analysis indicate, the data from contrastive parallelism in EP point to the same conclusion.

Following what has been described about emphasis in other languages (e.g., Ladd & Morton 1997) and looking at the present results, I propose that energy plays a secondary role in marking contrast in contrastive parallelism structures. Nevertheless, if we take into account the fact that the energy maximum levels show the same pattern as the f_0 levels in general, it can be considered that energy and f_0, together, contribute to the prosodic marking of these parallelism structures through emphasis. Hence, emphasis can be seen as a gradient element, as is argued by Ladd (2008) and Ladd & Morton (1997), that is an additional contribution to contrast marking.

Differently, phonological categories do not stand out in the same way as the phonetic parameters in the prosodic encoding of contrastive parallelism. In fact, only in the case of pre--nuclear accents significant differences were found in the distribution of pitch accents by type of constituent. Crucially, neither in (pre-nuclear and nuclear) pitch accents nor in boundary tones do we find a one-to-one relation between intonation and contrast. Nevertheless, the distribution of pitch accents does not seem random, since the data suggest the existence of a preferential relation between contrastive parallelism structures and their context and pitch accents with high targets aligned with stressed syllables. This aspect is showed by the higher frequency of high and rising pitch accents in T and C and, crucially, by the fact that some specific pitch accents were not found in Ctrl constituents (^H*, L+H*, and L+^H*, in pre--nuclear position, and ^H*, L+^H*, ^H*+L, and !H*, in nuclear position). On this matter, it is also worth noting the presence in both T and C of pitch accents that are related, in EP, to new information (H* and L+H*, Viana et al. 2007) focus (H*+L and ^H*+L, Frota 2000; Viana et al. 2007), and emphasis (H* and ^H*, Viana et al. 2007). In what regards boundary tones, the higher frequency of high boundary tones found in T (44.2%) can be related to the complexity of the utterances in which parallelism structures are present. Since the utterances can be composed of a variable number of complex sentences, with coordination, subordination, parentheticals, etc., and can be of variable length (cf. examples (1) and (2)), high boundary tones can be used to convey continuity.

Furthermore, a note should be made about the fact that T and C show more similar values throughout the analysed parameters. This can be explained by taking into account the concept of "contextual set" (Stalnaker 1978; Reinhart 1982). If it is assumed that the context of a contrastive parallelism structure plays a key-role in its interpretation, then it can be argued that the context can share many of the prosodic features with the target structures, in order to prepare a correct interpretation of the latter. Thus, f_0 and energy features, for example, show a gradient increase of values from context to contrastive parallelism structures, whereas for pitch accents distribution, context constituents have stronger (although not statistical significant) similarities with the ones belonging to contrastive parallelism structures.

Hence, the results discussed so far outline some properties that are distinctive of contrastive parallelism structures, especially in comparison to neutral statements. Moreover, the data indicate that a stronger relation is established between acoustic measures and contrast marking in contrastive parallelism structures than between intonation and the structures in question.

Additionally, it should be noted that many of the acoustic-phonetic parameters, as well as nuclear pitch accents and boundary tones, present significant differences between the two speakers. These results are also relevant, since they are in line with what has been described in previous studies about the variation across speakers found in the prosodic marking of contrast (e.g., Braun & Ladd 2003; Borràs-Comes et al. 2010). On this matter, it is worth recalling that, for these authors, such variation is taken as an additional argument in favour of the gradient nature of contrast.

Regarding the role played by contrastive parallelism structures in the cohesion of the discourse, it is relevant to discuss if and in what ways contrastive parallelism affects the phrasing and melody of the utterances in which occurs. In this context, different types of copy and contrast strategies used by both debaters can be described in order to support the hypothesis that, in fact, contrastive parallelism is a cohesion mechanism that involves an interface between syntax and prosody.

Starting with phrasing, I was able to identify a strategy in the corpus that is frequently used by both debaters and that consists on the association of the same phrasing to sequences

that are built as parallel (regardless of the fact that these structures can be similar or contrasting in meaning). Example (3) illustrates this relation between prosodic phrasing and syntactic parallelism.

(3) Nós pensamos / que, na verdade, // há que definir um estatuto, // mas que esse estatuto // é necessário defini-lo // com os próprios trabalhadores, / *que não é / por medidas administrativas, // não é / por medidas repressivas, // não é / por pequenos golpes de Estado* // (…). (AC)[5]
'We think / that, in fact, // a statute must be defined, // but that statute // has to be defined // with the workers themselves, / *it is not / by administrative measures, // it is not / by repressive measures, // it is not / by little coups d'état* // (...).' (AC)

As can be seen in (3), the three clauses that are built as parallels exhibit the exact same phrasing, since the prepositional phrases – *por medidas administrativas* 'by administrative measures', *por medidas repressivas* 'by repressive measures', *por pequenos golpes de Estado* 'by little coups d'état' – consistently form independent intonational phrases from the ones that are formed by the negation adverb *não* 'no' and the copulative verb form *é* 'it is'.

The regularity in phrasing that is represented in (3) can be, to some extent, related to the traditional approach to intonational parallelism that can be found in works such as Palmer (1922), Crystal (1969), or Fox (1984). In fact, the definition of intonational parallelism as a phenomenon that involves tonal copy between nuclear accents of contiguous tonal units presupposes the existence of a great degree of regularity in phrasing, as is shown in (3). However, the data reveal that assuming a direct relation between the regularities that can be found in phrasing and intonation ignores possibilities such as the ones proven by the data presented by Wichmann (2000). On this matter, it is important to recall that this author described cases of intonational parallelism between non-consecutive tonal units found in a British English corpus. Similar strategies were also found in my corpus, as shown by example (4).

(4) Se / *o Partido Comunista [H* H+L* gL%]* // vier um dia // rectificar as suas posições, // (…) se / *o Partido [H* !H-] / Comunista [H+L* gL%]* // renunciar, // portanto, à sua teoria / golpista / e vanguardista, // (…). (MS)
'If / *the Communist Party [H* H+L* gL%]* // someday // rectifies its positions, // (…) if / *the Communist [H* !H-] / Party [H+L* gL%]* // renounces, // therefore, to its theory / of coups / and of vanguard, // (…).' (MS)

In this case of parallelism it is notorious that the tonal copy is maintained across the parallel occurrences of the nominal phrase *o Partido Comunista* 'the Communist Party' even though the phrasing is not always exactly the same (cf. Figure 6). In other words, although the nominal phrase *o Partido Comunista* 'the Communist Party' forms a single intonational phrase in the first of the parallel clauses and two in the second, this fact does not change the tonal copy realized by MS, since the pre-nuclear pitch accent of the first occurrence of the nominal phrase (H*) is copied as the nuclear pitch accent of the intonational phrase composed of *o Partido* 'the Party' and, in the same way, the nuclear pitch accent and boundary tone of

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[5] Note that, in all the examples presented in this section of the paper, the simple bar (/) indicates a minor intonational phrase boundary and the double bar (//) indicates a major intonational phrase boundary.

the first occurrence of this nominal phrase (H+L* gL%) is copied as the nuclear pitch accent and boundary tone of the intonational phrase composed of *Comunista* 'Communist'.
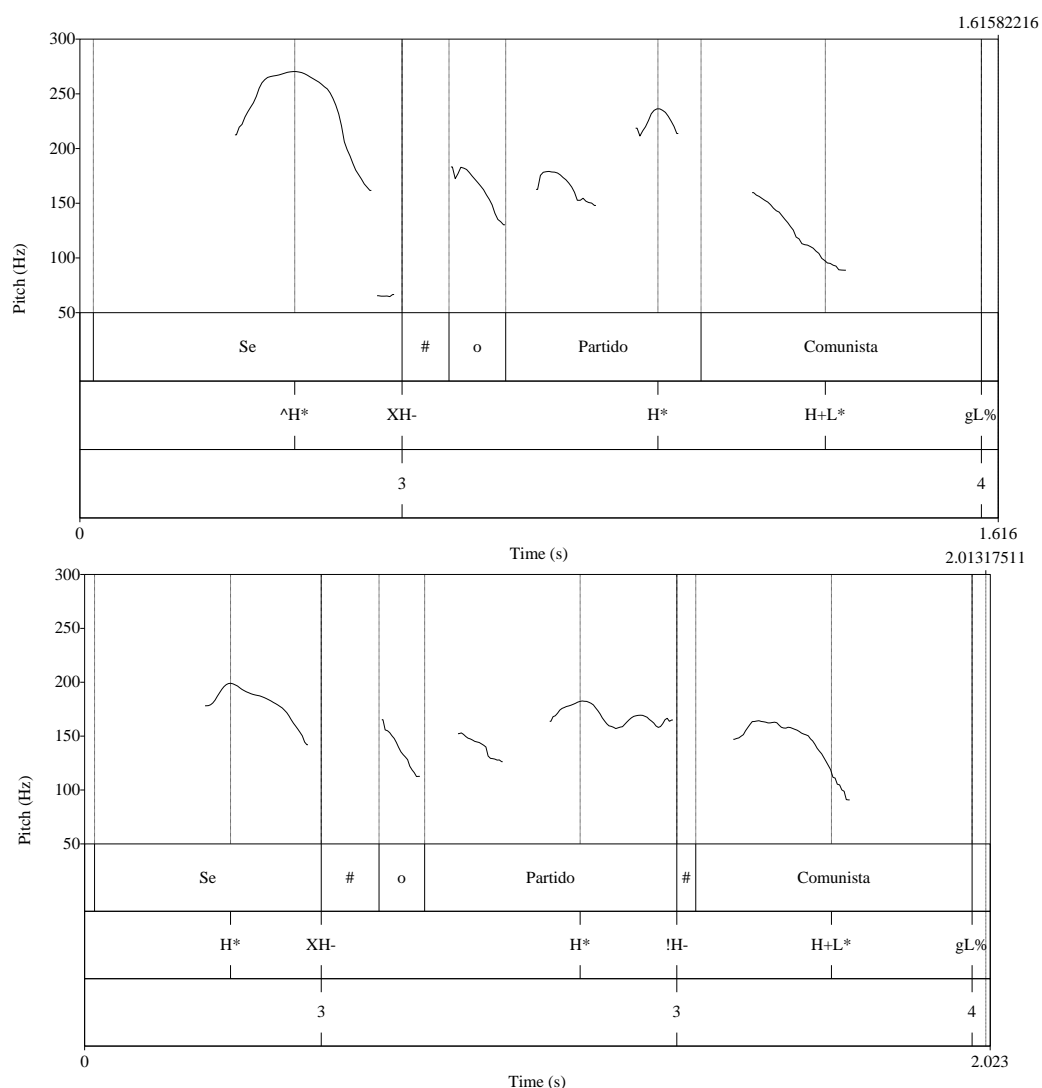

Figure 6: Intonational phrases of example (4) that evidence intonational parallelism in spite of differences in phrasing.

Besides phrasing, it is important to note that contrastive parallelism influences the melody of utterances as well and that this influence can be seen in strategies of copy and contrast used in the speech of both debaters. Considering the copy strategies, I can start by stating the presence in the corpus of tonal copy between contiguous intonational phrases (cf. example (5)), which is in line with what has previously been described in the literature about intonational parallelism (Palmer 1922; Crystal 1969; Fox 1984; Bolinger 1989; Wichmann 2000).

(5) *Nós [L+H* XH-] / somos pela unidade [L+H* gL-] / na base [L+H* gL-] / e sempre o dissemos [L* H* L%], //* mas não pela unidade imposta pelo Estado, não os sindicatos transformados em correias de transmissão do Partido Comunista. (MS)

'We [L+H* XH-] / are in favour of the unity [L+H* gL-] / in the base [L+H* gL-] / and we have always said so [L* H* L%], // but we are not in favour of a unity imposed by the State, we are not in favour of the unions turned into riggers of the Communist Party.' (MS)

In this example, the tonal copy concerns mostly the nuclear pitch accents and, crucially, there is a repetition of a rising f_0 movement across contiguous intonational phrases, as can be seen in Figure 7.
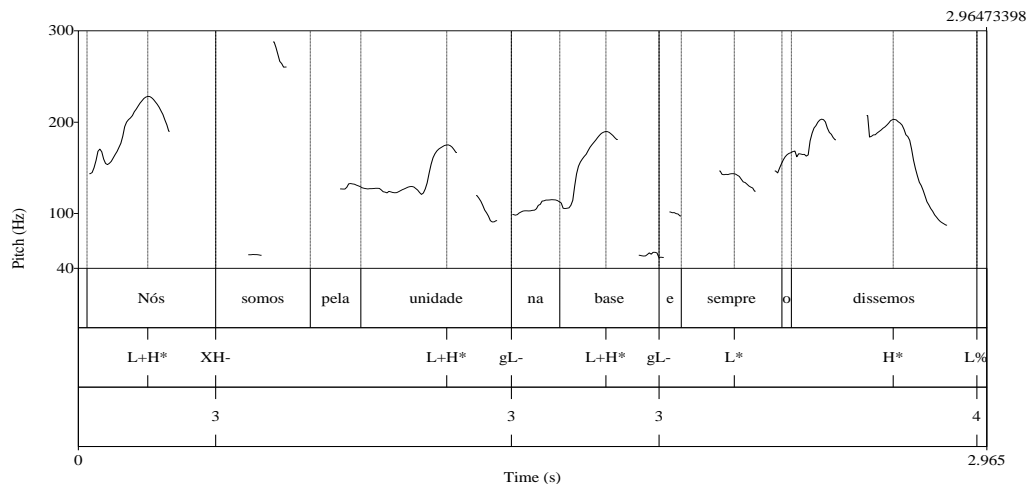

Figure 7: Intonational phrases of example (5) that evidence intonational parallelism between contiguous intonational phrases.

On the other hand, the data reveal that tonal copy can also reflect, in a more evident way, the interface between syntax and prosody. This aspect is evidenced by the finding that, in parallel structures, constituents with the same syntactic function can be associated to the same intonational contours or pitch accents (cf. example (6)).

(6) Portanto, não queremos [H+L* L+H* L-], / de forma nenhuma [H*+L L+H* H%], // pois nem temos [H*+L L-] / defendido, [L+H* gL-] / de forma nenhuma, [H*+L L+H* gH%] // a instauração dum regime [H* L+H* !H%] // unipartidário; [H* L+H* !H%] // não temos defendido, [H*+L L+H* H-] / de forma nenhuma, [H*+L L+H* H%] // a instauração dum regime [H* L+H* H-] / sem liberdade de imprensa, [H* L+H* H%] // pelo contrário, [L+H* H%] // temos defendido [H*+L L+H* H-] / a mais ampla [L+H* L-] / liberdade de imprensa [H* L+H* H%] // (…). (AC)
'Hence, we do not want [H+L* L+H* L-], / in any way [H*+L L+H* H%], // and we have not [H*+L L-] / defended [L+H* gL-] / in any way, [H*+L L+H* gH%] // the establishment of a one party [H* L+H* !H%] // regime; [H* L+H* !H%] // we have not defended, [H*+L L+H* H-] / in any way, [H*+L L+H* H%] // the establishment of a regime [H* L+H* H-] / with no free press, [H* L+H* H%] // on the contrary, [L+H* H%] // we have defended [H*+L L+H* H-] / the most broad [L+H* L-] / free press [H* L+H* H%] // (…).' (AC)

Regarding (6), it is worth noting that the intonational phrases in which the verb forms are realized – *Portanto, não queremos* 'Hence, we do not want', *pois nem temos defendido* 'and

we have not defended', *não temos defendido* 'we have not defended', *temos defendido* 'we have defended' – exhibit tonal copy and, what is more, similar f_0 contours. The same can be said for the intonational phrases composed of the prepositional modifier *de forma nenhuma* 'in any way' and prepositional connector *pelo contrário* 'on the contrary', on the one hand, and for the intonational phrases that correspond to the syntactic constituents with the direct object function in the clauses that are parallel, on the other hand. This means that, as exemplified by Figure 8, constituents with the same syntactic function are prosodically marked with similar intonation contours and similar f_0 movements.
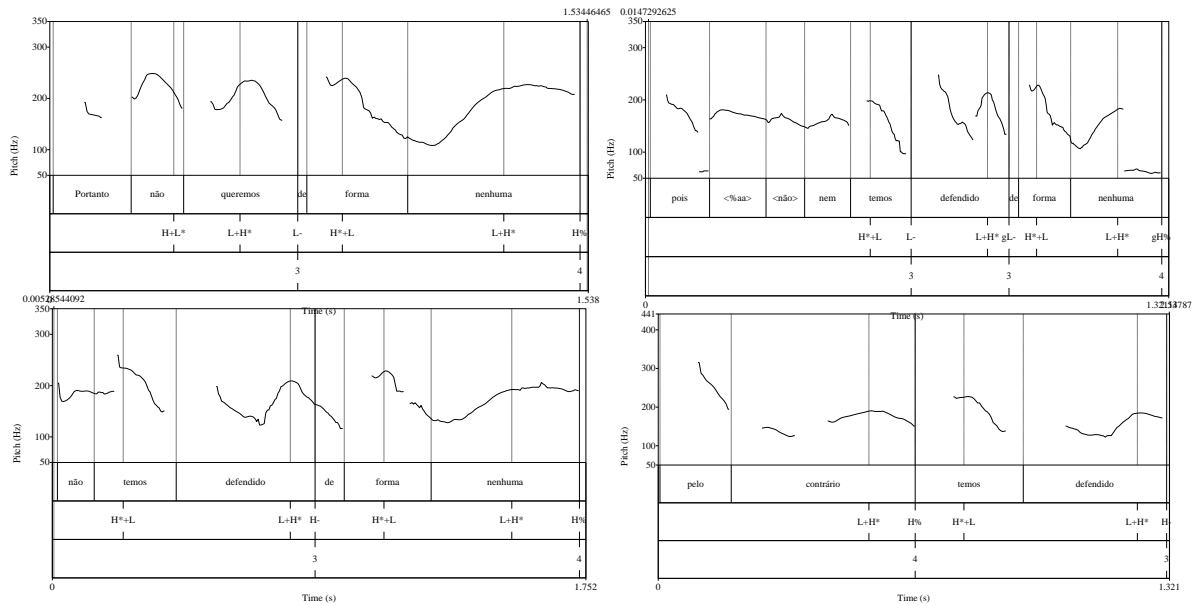
Figure 8: Intonational phrases of example (6) that evidence intonational parallelism involving constituents with the same syntactic function.

Lastly, it can be observed that both AC and MS use what can be called tonal contrast in order to prosodically mark contrastive parallelism. Crucially, in such cases, the relation between the prosodic structure, the syntactic structure, and the propositional structure of utterances is at play. Tonal contrast can thus be described as the association of different and, more specifically, opposing pitch accents or intonation contours to intonational phrases that convey propositions whose truth-value is contrasted in contrastive parallelism structures. This strategy of marking contrast, which is illustrated in (7), can translate in the realization of pitch accents characterized by distinct f_0 movements (e.g., rising movements versus falling movements), in changes in the alignment of the target (high or low) with the stressed syllable, or in differences in amplitude of the f_0 movement.

(7) O Governo / *constituiu-se, [L+H* gH%]* // o Governo / *tem condições [H* L+H* XH%]* // para marchar, // este Governo, // a meu ver, // *não tem [L+H* H+L* XL-]* / alternativa de esquerda, // *é [H*+L XL%]* // um governo / de esquerda // (…). (MS)
   'The Government / has *formed [L+H* gH%]* // the Government / has *conditions [H* L+H* XH%]* // to follow through, // this Government, // as I see it, // *does not have [L+H* H+L* XL-]* / a left-wing alternative, // *it is [H*+L XL%]* // a left-wing / Government // (…).' (MS)

As can be seen in (7), the intonational phrases composed of *constituiu-se* 'has formed' and by *tem condições* 'has conditions' exhibit rising nuclear pitch accents, but the intonational phrases that semantically contrast with these, composed of *não tem* 'does not have' and *é* 'it is' present falling nuclear pitch accents. Moreover, the specific contrast between *não tem* 'does not have' and *é* 'it is' is also marked by differences in alignment of the target with the stressed syllable (cf. Figure 9).
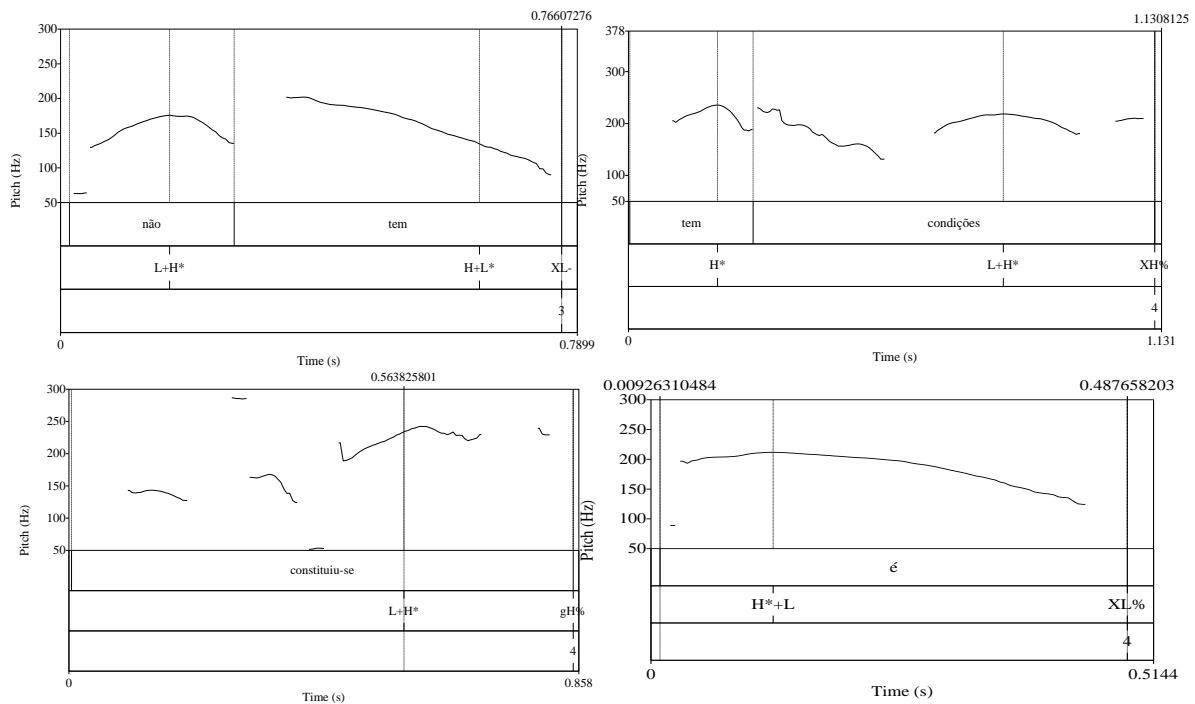
Figure 9: Intonational phrases of example (7) that illustrate the use of intonational contrast as a way to prosodically mark contrastive parallelism structures.

Hence, the data presented point out the importance of the relation between prosodic structure and syntactic structure in contrastive parallelism. A repetition structure, with the same word order and/or the same sentence structure (Duarte 2003), such as parallelism, is marked in the interface syntax / prosody. In contrastive parallelism structures, this interface shows itself in the presence of regularities and patterns of repetition and contrast in the intonation and phrasing that are related to the argumental structure of parallel clauses.

6. Conclusion

The main goal of this paper was to study the prosodic encoding of contrast in EP, focussing in a specific type of structures, namely contrastive parallelism structures. The choice of such structures was related to the corpus analysed – a political debate – in which parallelism structures and, more specifically, contrastive parallelism seem to play an important role in the cohesion of an argumentative discourse such as the one in question.

Hence, this study aimed at contributing to answer to three main questions:

(i) What prosodic features are associated with structures of contrastive parallelism?

(ii) Is the prosodic encoding of contrastive parallelism gradient or categorical?

(iii) What is the role of contrastive parallelism in the syntax/prosody mapping? Does it have an effect on the melody and phrasing of utterances?

Regarding the first question, the data from phonetic measures and from phonological parameters indicate that contrastive parallelism has specific acoustic properties, but, crucially, there is no one-to-one relation between pitch accents and this type of structures. These findings suggest that the answer to the second question should be that the prosodic encoding of contrastive parallelism is gradient. The fact that the acoustic and phonetic properties associated with contrastive parallelism structures seem to be the determining factor also points in that direction and, importantly, these findings are in line with what has been described for other languages (e.g., German, Italian, and Catalan) about the prosodic encoding of contrast (Braun & Ladd 2003; Baumann et al. 2006; Borràs-Comes et al. 2010; Torregrossa 2012). As discussed in the previous section of this work, notably, the energy and (most of all) the f_0 levels, both local and global, indicate a clear and significant difference between the target structures of this study and the control items, i.e., neutral declarative sentences. Furthermore, the data also suggest the existence of a continuum between the context preceding the contrastive parallelism structures and the actual contrastive parallelisms, since they have closer f_0 and energy values when compared with the control items. Thus, the acoustic and phonetic properties associated with contrastive parallelism structures seem to be crucial, which can indicate that the prosodic encoding of contrastive parallelism is gradient.

Concerning the third question, the data reveal that contrastive parallelism influences the temporal and melodic structure of the utterances in which it occurs. On this matter, some strategies used by the two debaters in their speech were presented that portray regularities in phrasing and the use of tonal copy and contrast in contrastive parallelism structures. These findings allow me to argue in favour of the crucial role of the interface between syntax and prosody in contrastive parallelism, here taken as a cohesion mechanism.

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