The Prosody of Focus: a Case-Study with Cross-Linguistic Implications

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Abstract

It is well-known that focus may have a prosodic reflection in various languages, affecting prosodic phrasing, prominence and/or intonation. However, the issue whether there is any relationship among the different kinds of prosodic marking remains unclear. This paper presents a detailed examination of the prosody of focus in European Portuguese. It is shown that there are no phrasing effects of focus; by contrast, phrasal stress and tonal events play a crucial role in the expression of focus. Implications of these findings for a cross-linguistic understanding of focus prosody are explored, namely it is argued that the prosodic reflexes are not universal, or arbitrary.

1. Introduction

One of the fields in which prosody is known to contribute to the meaning of an utterance is the expression of focus phenomena. It is well-established that focus may have a prosodic reflection in various languages, being cued by prosodic phrasing, phrasal prominence, and/or intonation. It is much less clear, however, whether there is any relationship among the different kinds of prosodic marking, as most studies have concentrated on one particular kind of focus manifestation. Despite this limitation, the prosodic literature allows the following observation: in languages like English, Dutch, or Italian, the relation between focus and intonation phenomena is particularly highlighted (e.g. [9], [5] and [1]), whereas a focus effect on prosodic phrasing seems to be prevalent in languages like Hungarian or Korean (e.g. [13] and [7]). It is an open question whether these focus manifestations are language-specific arbitrary choices or follow in a principled way from some other linguistic property(ies) of the language or language structures studied.

This paper investigates the prosodic reflexes of focus in European Portuguese (EP), both from the prosodic phonology and the intonational phonology view. Thus, all the three kinds of prosodic marking of focus mentioned above are examined. The empirical domain of the present research is confined to free and single (narrow/contrastive) focus of simple constituents in one-clause declaratives with basic word order (i.e. SVO).

2. Methods

Several experiments were designed with the aim of collecting materials that would enable the assessment of the effects of focus at the levels of prosodic phrasing, phrasal prominence, and intonation. Sandhi and rhythmic phenomena, as well as tonal-edge marking, have been used as tests for prosodic phrasing. Syllable duration and pitch accent distribution/type have been taken as cues to phrasal prominence. A thorough intonation analysis of every token was also performed.

For every sentence in the corpus several readings were obtained by setting up a felicitous context by means of a previously uttered question or paragraph. The readings elicited by the contexts were broad focus, narrow focus, narrow contrastive focus, and topic, as illustrated in (1) (potential contexts for sandhi application are marked in italics). The tokens thus obtained constitute minimal pairs only varying in their interpretation.

(1) A*s* angolana*s* ofereceram especiaria*s* aos jornalistas
The Angolans gave spices to the journalists
a. Broad Focus or Neutral
Disseram-me ontem:
I was told yesterday:
b. Narrow Focus
Quem ofereceu especiarias aos jornalistas?
Who gave spices to the journalists?
c. Narrow contrastive focus
Foram as moçambicanas que ofereceram especiarias aos jornalistas?
Did the Mozambicans give spices to the journalists?
d. Topic
Angolanas e moçambicanas resolveram presentear os jornalistas com ofertas dos seus países. As moçambicanas trouxeram plantas exóticas.
Angolans and Mozambicans decided to offer gifts from their countries to the journalists. The Mozambicans gave them exotic plants.

The speech materials were read 3 times by 5 female speakers of the Lisbon variety of EP. Data validation of the speech materials was performed by means of a context-matching perception test in which each rendition was checked for its intended reading by 9 other subjects. A total of 1734 utterances were validated. These utterances were subsequently digitized at 16kHz and analyzed using both the Sensimetrics Speech Station package for speech analysis in PCs and PRAAT (further details on the procedure followed are given in [3]).

3. Prosodic phrasing

A focus effect on prosodic phrasing has been assessed both at the phonological phrase (ϕ) and the intonational phrase (I) levels, which have been shown to be at stake in several languages when focus effects on phrasing are reported.

3.1. Intonational phrase

The facts of sandhi clearly show that I-formation in EP, as in many other languages, maps adjacent phrases within a root sentence onto an I-phrase, whereas elements such as topics and parentheticals are exhaustively mapped onto an I-phrase of their own. This is illustrated in (2) by the facts of Fricative Voicing, a segmental process whereby a word-final fricative

preceding a word-initial vowel within the same I-phrase is realized as [z].

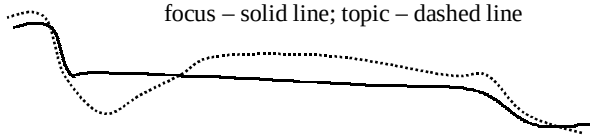
(2) a.[A[z] angolana[z] ofereceram especiaria[z] aos jornalista[ʃ]]$_I$ (*neutral*)
The Angolans gave spices to the journalists
b.[A[z] angolana[ʃ]]$_I$ [ofereceram especiaria[z] aos jornalista[ʃ]]$_I$ (*topic*)
c.[A[z] angolana[z] ofereceram especiaria[ʃ]]$_I$ [aos jornalista[ʃ]]$_I$ (*topic*)

Focus was found not to affect the application of any of the sandhi processes observed, as (3) illustrates resorting again to Fricative Voicing (in the examples focalized constituents are shown in capitals). This is so whether the sentences uttered are responses to a narrow focus or a contrastive focus elicitation context.

(3) a. [A[z] ANGOLANA[z] ofereceram especiaria[z] aos jornalista[ʃ]]$_I$
b. [A[z] angolana[z] ofereceram especiaria[z] AOS JORNALISTA[ʃ]]$_I$

The identity in phrasing between focus utterances and neutral ones against topic utterances is further supported by intonational facts. As depicted in (4), only after the topic nuclear fall, but not after the focus nuclear fall, does the contour reach its minimal level, what is consistent with the presence of a tonal boundary marking a topic but not focus.

(4) As angolanas ofereceram especiarias aos jornalistas
focus – solid line; topic – dashed line



3.2. Phonological phrase

Like in other languages, ϕ-formation in EP applies within the maximal projection of a lexical head (Lex^{max}). Our results show that ϕs in EP include the lexical head, the elements on the head's nonrecursive side within Lex^{max}, and a following nonbranching phrase also within the Lex^{max} domain. This is illustrated by (5), where a rhythmic process of stress clash resolution applies to the clashing sequence in (a) but not in (b): if the two clashing syllables belong to the same ϕ-phrase, the first syllable gets lengthened (word stress in bold).

(5) a. O professor mostrou-me uma figura [com um java**li** **á**tico]$_\phi$
The teacher showed me a picture of a wild pig from Attica
b. [o ga**lã**]$_\phi$ **an**da de porsche
The hero drives a Porsche

Focus (whether narrow or contrastive) was found not to change the clash resolution conditions, that is the rhythmic process applies precisely in the same fashion irrespective of the focalized status of the intervening elements. This is illustrated in (6), where 'li' but not 'lã' lengthens with respect to its focalized counterpart in a non-clashing sequence.

(6) a. O professor mostrou-me uma figura [com um JAVA**LI** **á**tico]$_\phi$
b. [O GA**LÃ**]$_\phi$ **an**da de porsche

The absence of a focus-induced change on phrasing is further supported by the lack of boundary tonal marking. As shown in (7), the pitch fall endpoint does not move to the right with the increasing number of posttonic syllables, neither does the peak move to the left with the decreasing number of pretonic syllables.

(7) a. 
MAN**H**Ã
b. 
AN G O**LA**NAS
b. 
AR**QUEÓ**L O G A S

4. Phrasal prominence

Languages have neutral/default prominence patterns that occur in broad focus utterances (e.g. [9]). In EP, neutral prominence is rightmost in all phrasal domains. An analysis of pitch accent distribution shows that the final non-enclitic word in the I-phrase always gets a pitch accent, and although ϕs are not necessarily tonally marked the final non-enclitic word within a ϕ has to bear a pitch accent for non-final words to be also pitch-accented.

Along the lines of most prominence accounts of English and other Western European languages, we take the view that when a particular constituent is focalized default prominence gives way to marked prominence. However, our results show that contrary to English (e.g. [9] and [5]) but similarly to Italian [1] marked prominence in EP is not positionally defined, namely it is not equivalent to early prominence. This is shown by the lack of ambiguity between neutral utterances and utterances with late focus, as in (8). In a context-matching perception test, subjects reliably perceived (8a) as a felicitous answer to a what-happened question, whereas (8b) was perceived as a felicitous answer to a wh- or yes-no question eliciting narrow/contrastive focus [3]. Although nuclear stress prominence is final in both cases, no perceptual ambiguity arises from stress position. Clearly, then, default and marked prominence are distinct regardless of position.

(8) a. w w s
[[As angolanas]$_\phi$[ofereceram especiarias]$_\phi$[aos jornalistas]$_\phi$]$_I$
(*neutral*) It so happened that the Angolans gave spices to the journalists
b. w w s
[[As angolanas]$_\phi$[ofereceram especiarias]$_\phi$[AOS JORNALISTAS]$_\phi$]$_I$
(*focus*) The Angolans gave spices to the journalists, and not to someone else

The difference between the two types of prominence pattern is further supported by the duration facts. The lengthening found in the focalized *jornalistas* in (8b) is significantly different from that of its neutral counterpart in (8a) ($p < .05$), or from that of its topic counterpart (see 2c). By

contrast, no significant difference was found between the lengthening of the neutral and topic conditions. As in all the three cases *jornalistas* bears the I-phrasal stress, these results support a contrast in the **type** of prominence pattern that goes beyond the positional difference: default (for the neutral and topic cases) versus marked prominence (for the focus cases).

In short, and unlike prosodic phrasing, phrasal stress plays an important role in the expression of focus in EP.

5. Pitch accent type

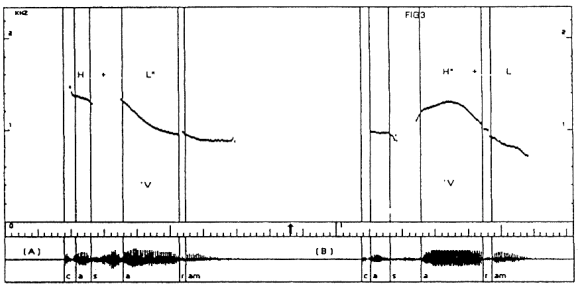


Figure 1: f_0 contours of *Ca***s**a*ram* 'They got married': (A) neutral contour; (B) focus contour.

Under the intonational phonology approach to intonation followed here, prominence is a basic organizing principle for tune structure. If default and marked prominence are categorically distinct as suggested above, it would not be unexpected that the two patterns are cued by different tonal realizations. Our results show a pitch accent structure difference between neutral and focus utterances. This difference is clearly depicted in Fig. 1: in the neutral contour, the low aligns with the stressed syllable and the peak precedes it; in the focus contour, it is the peak that aligns with the nuclear syllable and the low is realized in the following syllable (the sound files for Fig. 1, Fig. 2 and (9) below can be found at <http://www.fl.ul.pt/pessoais/sfrota/soundfiles.htm>). These target alignment differences are systematic regardless of factors like utterance size and focus location in the utterance, and thus support a phonological analysis of the two nuclear falls respectively as H+L* and H*+L ([4]). The fact that the pitch accent contrast is retained in the final nuclei cases, and no other tonal difference adds to the distinction between the neutral and focus interpretations (Fig.2) shows the importance of accent type considerations for the expression of focus in EP. In this respect, EP is like Bengali and Italian [6, 1], two other non-ambiguous languages described in the literature that also use special pitch accents to cue different focus readings, and unlike English and German that resort to nucleus placement and other tonal features such as the absence/reduction of prefocal accents to cue similar meaning differences [5, 10]. However, all these languages make crucial use of phrasal prominence and intonation phenomena to express focus.

EP questions also show a nuclear pitch accent difference between neutral and focused yes-no interrogatives, which is illustrated in (9). While the nuclear fall of the neutral declarative also characterizes global questions, focused questions contain a nuclear rise instead. Again, like in declaratives, the pitch accent difference (H+L* versus L*+H) is systematic and independent of focus location (see [4]).

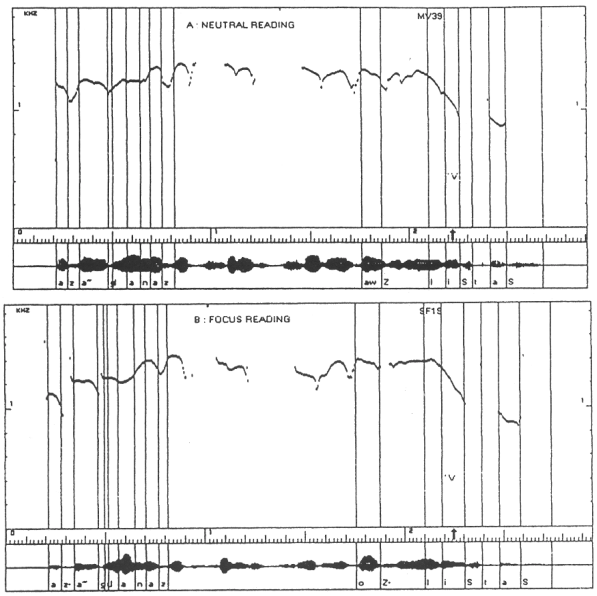
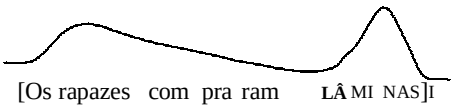


Figure 2: f_0 contours of the utterances in (8) above.

(9) a.

[Os rapazes com pra ram **lâ** mi nas]I
Did the boys buy slides (for the microscope)?

b.



[Os rapazes com pra ram **LÂ** MI NAS]I
Did the boys buy SLIDES (for the microscope)?

The fact that the EP tonal inventory includes distinct tonal morphemes for focus both in declaratives and interrogatives further supports the case for the relevance of pitch accent type to prosodic focus marking.

6. Cross-linguistic implications

It was shown that the prosodic reflexes of focus in EP are **stress** and **accent** effects, and crucially not phrasing effects. Clearly, then, EP behaves like English or Italian – languages in which prominence-related properties (stress and accentual/tonal) are crucial to focus marking –, and unlike Hungarian or Korean, because focus does not determine phrasing (note that the so-called 'focus-restructuring' that has been described for English and Italian on the basis of the rhythm rule has alternative explanations which are independent of phrasing changes and dock at phrasal stress and pitch accent placement instead – [3]).

6.1. The non-arbitrary nature of focus prosody

The difference in prosodic marking at stake can not be ascribed to language-specific phonological properties concerning the way prominence features are organized, as shown in (10): on the one hand, English, Italian and EP, as well as Hungarian, are all intonation languages (in the sense that they have postlexical pitch accents associated with

stressed positions); on the other hand, the languages that illustrate the use of phrasing cues have disparate phonological properties.

(10)	LANGUAGES	PHONOLOGICAL PROPERTIES
a.	English, Italian and EP	Stress accent, pitch accents, boundary tones
b.	Korean	No stress accent, (postlexical) phrasal and boundary tones
	Hungarian	Stress accent, pitch accents, boundary tones

It is also not the case that stress and accent effects are just the counterpart of phrasing effects in languages which have pitch accents (as suggested in [9]). This view is contrary to fact: (i) it leaves the Hungarian focus-induced phrasing effects unaccounted for; (ii) it predicts that focus should have a prosodic reflexion in all languages, either by phrasing or accentuation, but languages without a prosodic manifestation of focus do seem to exist (like Wollof, see [11]).

Although the prosodic manifestations of focus look arbitrary from a phonological viewpoint, a different picture emerges when other linguistic properties are taken into account. The differences in prosodic marking correlate nicely with syntactic differences in overt signaling of focus: phrasing effects seem to obligatorily arise in languages that realize focus in a particular syntactic position in sentence structure (as is the case of Hungarian and Korean, e.g. [8]), whereas prominence-related effects are a crucial cue to focus in languages without any clear overt focus morphology and syntax (e.g. English, Italian or EP). If it is assumed that the focus-related syntactic properties may be encoded at the syntax-phonology mapping like other syntactic properties (e.g. edges of syntactic phrases, head/complement relations), the variation regarding the prosody of focus would straightforwardly follow. It is crucial in this regard that functional or empty syntactic elements are irrelevant to the syntax-prosody mapping, as repeatedly noted in the literature (e.g. [12]). Thus, only languages (or language structures) with **overt** syntactic marking of focus are expected to trigger obligatory phrasing effects.

6.2. The Basque example

The facts of Basque are a good testing ground to the validity of the correlation just described. A well-known trait of Basque grammar is the presence of a structural focus position, roughly the preverbal position [2, 8]. This also applies to Lekeitio Basque (LBq), the dialect whose prosody we will consider. On the prosody side, LBq has a lexical pitch accent, phrasal and boundary tones, and a postlexical phrasal accent. According to data in Elordieta's work (e.g. [2]), the structural focus position plays a decisive role in LBq prosody: the right-edge of the syntactic focus position is obligatorily mapped into a prosodic (accentual phrase) boundary, which is invariably signaled by a postlexical phrasal accent. In conclusion, the prosodic reflexes of focus in Basque pattern as predicted on the basis of the correlation described above.

6.3. Focus prosody is not universal

The data discussed here supports a principled correlation between focus syntax and focus prosody. How can languages without prosodic manifestations of focus (as Wollof – [11]) fit into this view of the focus-prosody interface? If a language signals focus by means of heavy morphology with no overt syntactic consequences, the absence of phrasing effects is expected. Further, if a language has no tonal / pitch accent system, the absence of prominence-related effects is also expected. In short, such a language would express focus morphologically, but would not cue focus prosodically. Wollof seems to fit into this description.

7. Conclusion

In this paper various kinds of prosodic marking of focus in EP have been examined. It was concluded that focus is heavily cued by phrasal stress and pitch accent type, but not by prosodic phrasing. Consequences of these findings for a cross-linguistic understanding of focus prosody have been explored and a principled relation between the morpho-syntax of focus and the prosody of focus was proposed. Future research on the empirical facts of focus prosody in several languages with disparate morpho-syntacic properties is needed to assess the general adequacy of this proposal.

8. References

[1] D'Imperio, M. in press. Italian intonation: an overview and some questions. *Probus Special Issue on Intonation in Romance Languages.'*

[2] Elordieta, G. in press. Intonation. In *A Grammar of Basque*, Hualde, J.I.; Ortiz de Urbina, J. eds. Oxford: Oxford University Press.

[3] Frota, S. 2000. *Prosody and focus in European Portuguese. Phonological phrasing and intonation.* New York: Garland Publishing.

[4] Frota, S. in press. Nuclear falls and rises in European Portuguese. *Probus Special Issue on Intonation in Romance Languages*.

[5] Gussenhoven, C. 1994. Focus and Sentence Accents in English. In *Focus and Natural Language Processing*. Bosch, P.; van der Sandt, R., eds. Heidelberg: Working Papers of the Institute for Logic and Linguistics, 83–92.

[6] Hayes, B.; Lahiri, A. 1991. Bengali Intonational Phonology. *Natural Language and Linguistic Theory*, 9, 47–96.

[7] Jun, S.-A. 1996. *The Phonetics and Phonology of Korean Prosody*. New York: Garland Publishing.

[8] Kiss, K. ed. 1995. *Discourse Configurational Languages.* New York, Oxford: OUP.

[9] Ladd, D. R. 1996. *Intonational Phonology.* Cambridge: CUP.

[10] Mixdorff, H. 1997. Production of broad and narrow focus in German. In *Intonation: Theory, Models and Applications*, Botinis, A.; Kouroupetroglou, G.; Carayiannis, G., eds. Athens: ESCA / University of Athens, 239-242.

[11] Rialland, A.; Robert, S. 2001. The intonational system of Wolof. *Linguistics*, 39(5), 893-939.

[12] Truckenbrodt, H. 1999. On the Relation between Syntactic Phrases and Phonological Phrases. *Linguistic Inquiry* 30(2), 219-255.

[13] Vogel, I.; Kenesei, I. 1987. The interface between phonology and other components of grammar: the case of Hungarian. *Phonology Yearbook* 4, 243–263.

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