Rhythm across European Portuguese varieties

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1. Research background

Rhythm: Orchestral music, language: proposed to result from a series of phonological and phonetic properties, such as syllable structure, vowel reduction and the correlates of stress (e.g., Dasher & Bolinger 1982, Dauer 1983).

A debate on the organization of languages into rhythmic classes is along a rhythmic continuum: long-standing agreement about the rhythm type of some languages (English and Dutch as stress-timed, Spanish and Italian as syllable-timed, Japanese and Tamil as mora-timed); other languages have been considered to be mixed or intermediate languages (e.g., Catalan, Basque, Portuguese, Polish, Nespor 1990); acoustic results from different kinds of measures (Δ%C, Vars, PVI’s) do not always distinguish between languages arguably belonging to different classes (Anvari 2012; Grab & Lee 2012).

2. Methods

General

- the analysis within and across varieties
- 2 regions belonging to the
- complement the
- Δ%C in
- the use of a common corpus; (iii) to contribute to the
- ALG
- Speakers:
- Varieties:
- for SEP and BP from

3. Results

Main Goals:
- (i) to give a preliminary analysis of the rhythmic properties of two southern varieties of EP – Aleto (Ale) and Alg (Alg)
- (ii) to contribute to the Interactive Atlas of the Prosody of Portuguese (vAProP) Project

Methodology

- Varieties: 2 interior Center and Southern varieties (Cintra 1971) for EP – Ale (Aleto) and Alg (Algavara).
- Speakers: 3 female speakers per variety, aged between 20-45 years-old, all recorded in loco.

Analysis:
- Consonantal and prosimantal intervals were marked in Prat (Boersma & Weenink 2007), on the basis of both auditory and acoustic cues, following standard criteria of segmentation (Turk et al., 2006, Frota & Vigário 2011) (Figure 2). Measures of rhythm (%ΔC were then automatically extracted from Correlator 2.1 (Maina 2009) and manually cross-checked. Δ%C was also computed in this preliminary stage, from 1 speaker per variety we visited.

Experiment 1: general comparison

- the corpus of Ramus et al. (1999), translated and adapted by Frota & Vigário (2001) was used
- 54 sentences were read twice in random order (54x2);
- this preliminary analysis, a total of 108 sentences were analyzed per variety (108x2)
- sentences have different lengths (in no. of syllables): from 15 to 21 syllables
- Δ%C and Δ%C were calculated for each variety and compared with total results for EP and BP (Frota & Vigário 2001). These results were obtained with 3 different corpora: MAVig – EP corpus analysed with the purpose of establishing the prosodic and intonational structure of the data (Vigário 1999)

2011 – a comparative EP/BP corpus, developed within the Project Rhythmic Patterns, Parameter Setting, and Language Change (Faposo, Brazil)

Presence – a proposal corpus corresponding to the translation of the multi-language corpus used in Ramus et al. (1999)

Results:

General Comparison

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Results:

- both Ale and Alg present higher scores of Δ%C than SEP and lower scores of Δ%V
- the same is observed when compared with BP: Ale and Alg present higher scores of Δ%C and lower scores of Δ%V

Altogether Portuguese varieties:

- Both southern varieties are stress-timed in the Δ%C dimension, with Ale within the range of %ΔC shown by syllable-timed languages, just like SEP, but Alg with %ΔC pointing to stress-timing
- Ale: seems to display a mixed rhythm, like SEP
- Alg: clearly stress-timed
- Tendency towards stress-timing as we move from North (SEP) to the South

- Δ%C vs. %ΔV in Portuguese varieties. Data for SEP and BP from Frota & Vigário (2001)

Further work is needed:

- expand the analysis within and across varieties, and add or develop other corpora; Frota & Vigário 2001 also use other acoustic measures (Vars and PVI’s) and compare the results
- complement the analysis of production data with perception experiments
- add to the debate on the organization of languages and varieties into rhythmic classes or along a rhythmic continuum

4. Conclusion

The rhythm properties remain the same:
- the Δ%C dimension allows to classify Ale and Alg as stress-timed languages
- the %ΔV dimension allows to distinguish within southern varieties – stress-timing in Alg, but syllable-timing in Ale, as in EP

The Dutch linguistic style is the new when the same basic model corpus is used.

For discussion (sum up)

- 2 regions belonging to the same variety (interior Center and South) may display different rhythmic properties
- Ale seems to present a mixed rhythm, like SEP, Alg a clearly stress-timed
- In the %ΔV dimension, Ale (and SEP) is more stress-timed, whereas in the Δ%C Ale presents stress-timing properties.
- These results seem to be related with previous observations on the hypothetical correlation between phrase structure and pitch accent distribution, with Alg being closer to Western Arabic (Cruz & Frota accepted). Further research is needed.
- The use of different corpora impacts on the results. Statistical data are also necessary.