Feet are parametric

even in languages with stress

Guilherme D. Garcia[1] and Heather Goad[2]

[1]Ball State University, [2]McGill University

gdgarcia@bsu.edu • heather.goad@mcgill.ca

NELS 49, 2018

Cornell

Intro

Goal: To show that Portuguese has lexical stress, but no feet

1. Word-minimality
2. Indeterminacy of foot types
3. Antepenultimate weight effects

- Despite surface similarities between Portuguese and English stress, the systems are formally very different

English

Stress in non-verbs:

- Right-to-left moraic trochees + final syllable extrametricality

  agenda $[\text{ə}_{\mu}(\text{ˈd}\widehat{\text{ʒ}}\varepsilon_{\mu}\text{n}_{\mu})_{\text{Ft}}\langle\text{də}_{\mu}\rangle]_{\text{PWd}}$

  Canada $[(\text{ˈkæ}_{\mu}\text{nə}_{\mu})_{\text{Ft}}\langle\text{də}_{\mu}\rangle]_{\text{PWd}}$

- Binary feet also regulate minimal word size

  chemistry $\rightarrow$ [kɛm], *[kɛ]

  Elizabeth $\rightarrow$ [lɪz], *[lɪ]

- ☞ **No subminimal (CV_{μ}) lexical words**

  Truncation and hypocorization never result in (CV_{μ})

  Lexical words must contain one binary foot (McCarthy and Prince 1986)

Portuguese

Stress in non-verbs:

- Right-to-left moraic trochees capture regular stress patterns

papel $[\mathrm{pa}_{\mu}(\mathrm{'p\varepsilon}_{\mu}\mathrm{l}_{\mu})_{\mathrm{Ft}}]_{\mathrm{PWd}}$ ‘paper’

sapato $[\mathrm{sa}_{\mu}(\mathrm{'pa}_{\mu}\mathrm{to}_{\mu})_{\mathrm{Ft}}]_{\mathrm{PWd}}$ ‘shoe’

☞ **But** subminimal words tolerated & generated productively

Lexical words *pá* $[\mathrm{pa}]$ ‘shovel’

Fusion *dou* $\rightarrow [\mathrm{do}]$ ‘(I) give’

Hypocorization *Fernanda* $\rightarrow [\mathrm{fe}]$

☞ ≈70% of possible CV words are real words

Portuguese

Stress in non-verbs: (See Garcia 2017)

- Regular stress: Ĥ] or X́L] — *papél* ‘paper’, *sapáto* ‘shoe’
- Exceptional stress:
  - LĹ] (3%) — *café* ‘coffee’
  - X́H] (11%) — *nível* ‘level’
  - X́XX] (12%) — *patético* ‘pathetic’

☞ This has led authors to propose **different** foot types:

Trochees (Bisol 1992)

Trochees and iambs (Lee 2007)

Trochees, iambs, and dactyls (Wetzels 2007)

Proposal

Stress without feet

- Aside from extrametricality, Portuguese stress $\sim$ English stress

But two important differences:

1. Violations of word-minimality
2. Indeterminacy of foot type

- 1-2 challenge the presence of the foot in Portuguese

Proposal

Stress without feet

Today: a **third** difference

3. **Antepenultimate weight effects on stress**

☞ Weight effects seal the fate against the foot in Portuguese and further motivate it in English

Weight effects in antepenultimate (APU) syllables

- APU stress in 12% of Portuguese non-verbs

  Previous studies: **exceptional extrametricality** (Bisol 1992)

  patético $[\mathrm{pa}_{\mu}(\mathrm{'t\varepsilon}_{\mu}\mathrm{ti}_{\mu})\langle\mathrm{ko}_{\mu}\rangle]$ 'pathetic' (ĹLL)

  fósforo $[(\mathrm{'f\mathfrak{o}}_{\mu}\mathrm{s}_{\mu}\mathrm{fo}_{\mu})\langle\mathrm{ro}_{\mu}\rangle]$ 'match (n)' (ĹLL)

- Weight effects problematic in APU position:

  marked metrical structure unavoidable
  - **ĹLL** → (ĹL)⟨L⟩ (uneven trochee)
  - **ĹLL** → (Ĺ)L⟨L⟩ (medial unfooted syllable)

Weight effects in antepenultimate (APU) syllables

Trisyllabic shortening

- English (Prince 1990; Hayes 1995)

sane → *sanity*	*[(ˈse$_{\mu}$ɪ$_{\mu}$)nɪ$_{\mu}$ti$_{\mu}$], [(ˈsæ$_{\mu}$nɪ$_{\mu}$)ti$_{\mu}$]
serene → *serenity*	*[sə$_{\mu}$(ˈri$_{\mu\mu}$)nɪ$_{\mu}$ti$_{\mu}$], [sə$_{\mu}$(ˈrɛ$_{\mu}$nɪ$_{\mu}$)ti$_{\mu}$]

Shortening results in more complete parse of the word into feet

☞ **No similar process observed in Portuguese**

Weight effects in APU syllables

Predictions

☞ **If Portuguese builds feet:**

Should not find H́LL ≻ ĹLL

I.e.: Weight-sensitivity should **not** be present in APU syllables

☞ **If Portuguese doesn't build feet:**

Weight-sensitivity should not be blocked in APU σs

(weight effects present in final and penult σs)

- **Which profile – H́LL or ĹLL – do native speakers favor?**
- **How do Portuguese and English compare?**

Experimental design

- Two forced-choice auditory tasks involving nonce words

  Speakers of Br. Portuguese ($n = 27$) and English ($n = 13$)

  Minimal pairs of nonce words with different stress location
  - Antepenultimate vs. penultimate stress
  - Portuguese ($n = 240$[1]) English ($n = 180$)

☞ Three weight profiles: **LHL, HLL, LLL**

Pt:	[gu.pla.ɾo] (LLL)	[bɾon.da.le] (HLL)	[bo.gɾen.da] (LHL)
En:	[kɪ.mɛ.sər] (LLL)	[lɪn.sɛ.kəf] (HLL)	[tɛ.prɪŋ.kəl] (LHL)

[1] Also included penult vs. final stress

Experimental design

“Which of these two words sounds more natural?”

[ˈkɪ.mɛ.sər] [kɪ.ˈmɛ.sər]

Experimental results and analysis

- Hierarchical logistic regressions using Stan in R (Carpenter et al. 2017)

```
response ~ weight +
(1 + weight | speaker) +
(1 | word)
```

By-speaker random effect + by-item random intercept

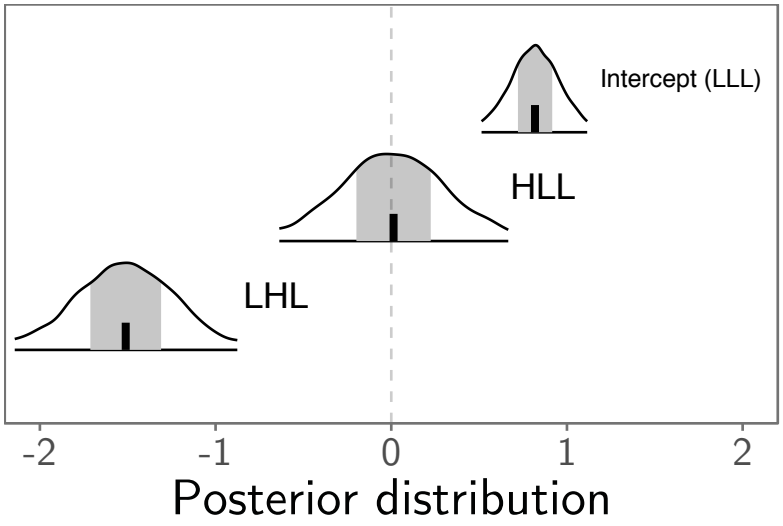
Experimental results and analysis

Effects relative to baseline (intercept = LLL)

Posterior distr. + 50% and 95% Highest Density Intervals

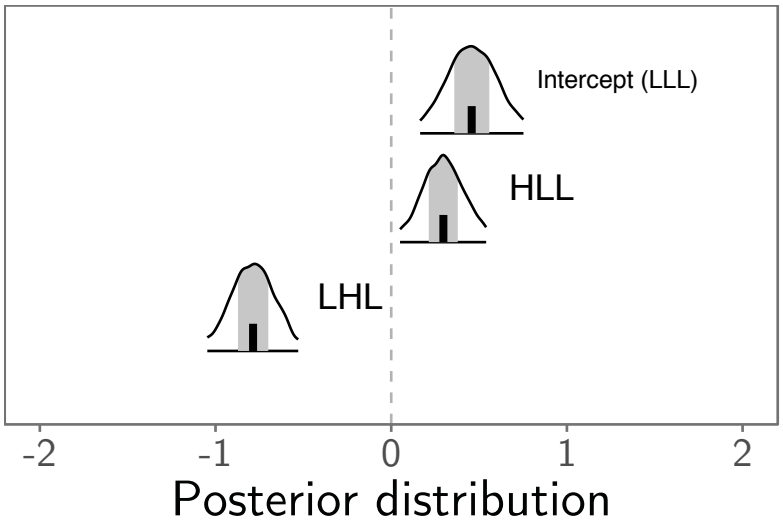
English weight effects:

ĹHL ∼ ĹLL



Portuguese weight effects:

ĹHL ≻ ĹLL



- Positive distributions → preference for APU stress rel. to LLL

Discussion and conclusion

English: consistent with **foot-based** approach

- ☞ Weight effects regulated by moraic trochees + $\langle\sigma\rangle]_{\text{PWd}}$
  - ĹLL ∼ ĹLL
  - No subminimal words

Portuguese: consistent with **footless** approach

- ☞ Weight effects not regulated by footing
  - ĹLL ≻ ĹLL
  - Subminimal words

☞ **Are there other languages like Portuguese?**

Discussion and conclusion

French

- Stress at the right edge of the **phrase**, not word (E.g., Dell 1984)

  [lə ɡʁɑ̃ ɡaʁˈsɔ̃], *[lə ˈɡʁɑ̃ ɡaʁˈsɔ̃] ‘the big boy’

- Subminimal words freely tolerated

  Lexical words *lait* [lɛ] ‘milk’

  Truncation *chimie* → [ʃi] ‘chemistry’

  Hypocorization *Myriam* → [mi]

- It has been proposed that **French is footless** (Jun and Fougeron 2000)

☞ **Portuguese more like French than like English**

Thank you!

Thanks to Natália Brambatti Guzzo and Jeff Lamontagne.

This research was supported by FRQSC and SSHRC.

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