

Variable secondary stress and weight-sensitivity in Portuguese

Guilherme D. Garcia

BALL STATE UNIVERSITY

guilhermegarcia.github.io

Annual Meeting of the Berkeley Linguistics Society (BLS)
University of California, Berkeley, Feb 2020

Intro

Secondary stress typically **not** affected by weight

(Gordon 2006)

Finnish:

Primary stress is word initial

Secondary stress affected by weight¹

(Lehiste 1965)

☞ Light syllables skipped if followed by heavy syllable

¹Also see Pater (2000) for English.

Finnish

- a. ká.las.tè.let ‘you are fishing’
- b. ká.las.te.lèm.me ‘we are fishing’ skipping with H
- c. fí.lo.sò.fis.sa ‘philosopher-INE’ no skipping with H
- d. á.te.ri.à.na ‘meal-ESS’ skipping with L
- e. pró.fes.so.rìs.sa ~ pró.fes.sò.ris.sa ‘professor-INE’ variation

Sonority & **clash avoidance** play a role in variation (Anttila 2010)

🗨 Lexical ⇔ post-lexical planes (Dresher and van der Hulst 1998)

Portuguese

Primary stress in non-verbs

Trisyllabic domain: $\sigma\sigma\sigma$]

Primary stress affected by weight

(Wetzels 2007; Garcia 2017)

Regular stress:

XXH → XXH́

jornal, papel ‘newspaper’, ‘paper’

XXL → XX́L

borboleta, cavalo ‘butterfly’, ‘horse’

Irregular stress

XX́L

abacaxi ‘pineapple’

X́XH

nível ‘level’

X́XX

patético ‘pathetic’

Portuguese

Secondary stress in non-verbs

Secondary stress weight-**in**sensitive

(Collischonn 1994, p. 45)

Stress every other pre-tonic syllable R-L

- a. ìnternàcionál
bòrboléta
pàralèlepípedo

‘international’
‘butterfly’
‘block paving’

Portuguese

Secondary stress in non-verbs

Variation: odd number of pre-tonic syllables

b. càcofonia ~ cacòfonia

‘cacophony’

mèlhoraménto ~ melhòraménto

‘improvement’

☞ Either **initial** or **peninitial** secondary stress

Could weight affect variation in secondary stress?

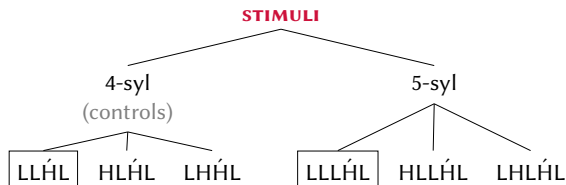
Methods

Auditory judgment task in Praat

(Boersma and Weenink 2020)

Nonce words in Portuguese ($n = 120$)

Native speakers of Brazilian Portuguese ($n = 20$)



Minimal pairs: initial vs. peninitial secondary stress

àrgadoríste ~ argàdoríste
mòrilánte ~ morilánte (control)

Methods

Stimuli

- ☞ Correlate for stress in Portuguese: **duration** (Major 1985; Moraes 2003)

Secondary stress → harder to capture:

Acoustic evidence not robust for Spanish

(Hualde and Nadeau 2014)

- ▶ Similar situation for Portuguese:

Some (most?) studies point to **duration**

(e.g., Moraes 2003)

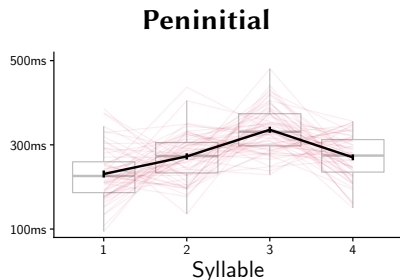
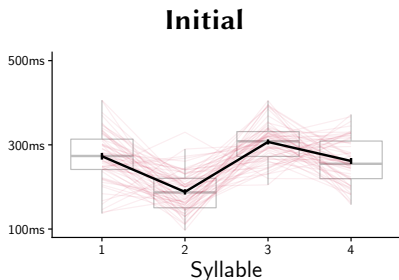
Some to **intensity**

(Fernandes-Svartman et al. 2008)

Methods

Duration in stimuli: 4σ (controls)

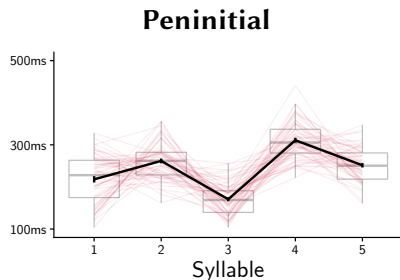
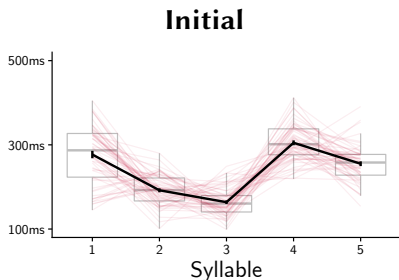
- 👉 **Durational** pattern for secondary stress in stimuli
Recorded by native speaker with phonetic training



Methods

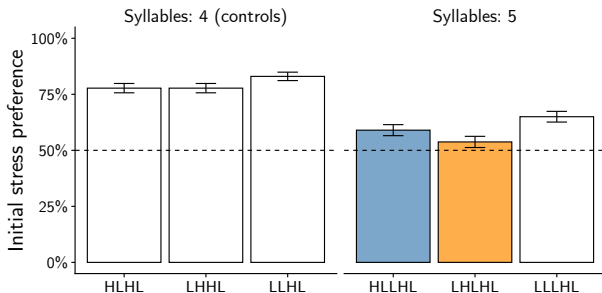
Duration in stimuli: 5σ

- 👉 **Durational** pattern for secondary stress in stimuli
Recorded by native speaker with phonetic training



Main results

Initial stress overall favored over peninitial stress
4- and 5-syllable words: expected difference

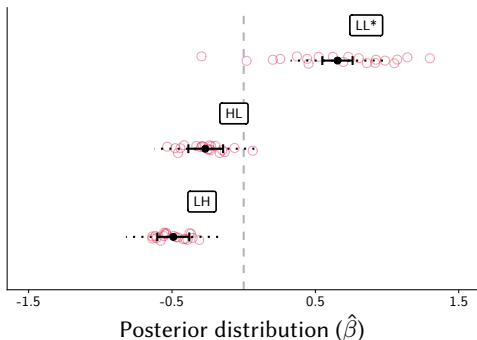


̀LLLÁL > ́LLÁL > ̀LHLÁL

Main results

Hierarchical logistic regression (50% and 95% CIs)

$\text{initial} \sim \text{weight} + (1 + \text{weight} \mid \text{ID})$

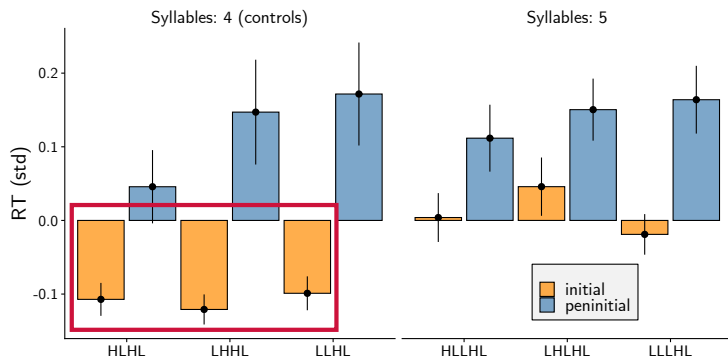


- ▶ Positive $\hat{\beta} \rightarrow$ **initial** secondary stress
Results interpreted relative to intercept (LL)*

Reaction time

Trends

Overall: faster RTs when choosing **initial secondary stress**



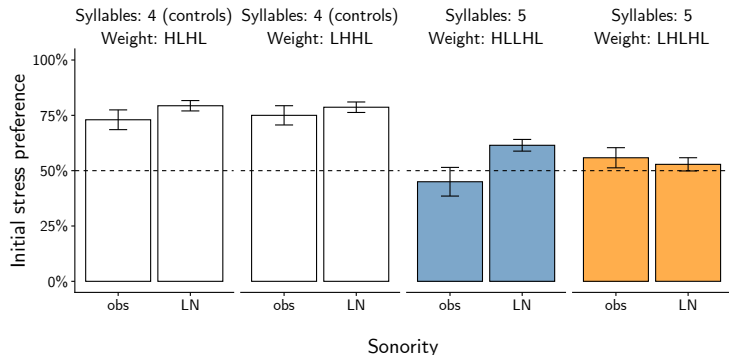
☞ **but** even faster for 4-syl words

Speakers also more certain when choosing initial stress

Coda sonority

Trends

- ☞ Initial stress preferred when coda contains liquid or nasal
- ▶ No clear trend in control items (4-syllable words)



Summary and discussion

- ▶ Overall: bias towards **initial** secondary stress
Stronger bias for 4σ words (clash avoidance)
- ▶ Location of $H\sigma$ seems to affect speakers' judgements:
H̀LLÁL > **ÌHLÁL**

☞ Lexical \Leftrightarrow post-lexical planes

(Dresher and van der Hulst 1998)

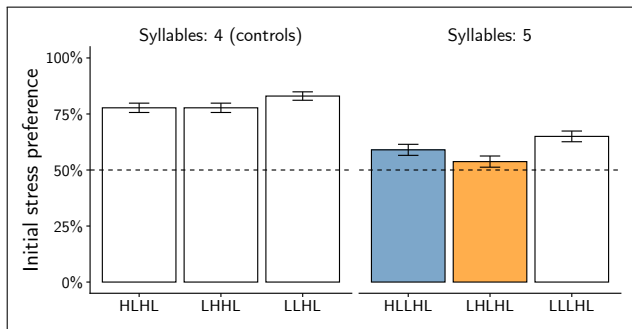
Why **ÌLLÁL** > **H̀LLÁL**?

Summary and discussion

50% ambiguity:

Speakers consistently find both options **good**

Speakers consistently find both options **not so good**



Hypothesis: presence of 2 H σ seen as less natural

☞ Confound in stimuli given lexical distribution of weight

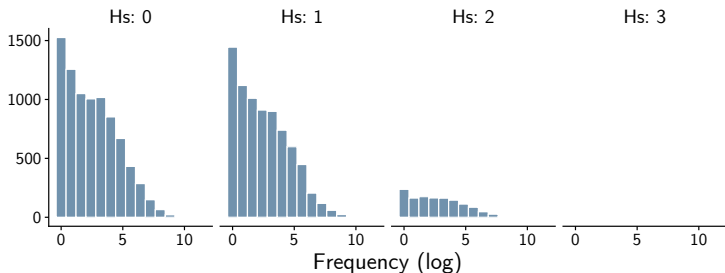
Summary and discussion

$\approx 90\%$ of all words in Portuguese have 0/1 H σ

(Garcia 2014)

☞ Same distribution when we control for frequency:

(Tang 2012)



(Whether or not we examine 4-5 σ words vs. all words)

Summary and discussion

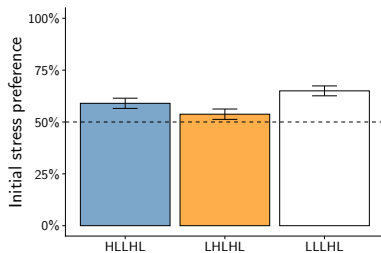
Could duration in the stimuli explain speakers' preferences?

A Initial:Peninitial ratio in i^{th} item with **initial** stress

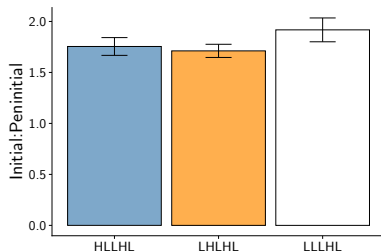
B Initial:Peninitial ratio in i^{th} item with **peninitial** stress

👉 Overall ratio **A:B** shows longer duration for initial σ

Main results (again)



Ratios



Final remarks and future directions

Next steps:

- A. Do we observe the same patterns with $L\acute{L}L]_{\omega}$ stimuli?
- B. Can durational ratios alone explain $\acute{L}LL\acute{H}L > \acute{H}LL\acute{H}L$?
- C. Does production mirror judgements?

Thank you!

This research is funded by Ball State University [19-0214]

References

- Anttila, A. (2010). Word stress in Finnish. Handout, Yale University.
- Boersma, P. and Weenink, D. (2020). Praat: doing phonetics by computer [Computer program].
- Collischonn, G. (1994). Acento secundário em português. *Letras de Hoje*, 29(4):43-55.
- Dresher, B. E. and van der Hulst, H. (1998). Head-dependent asymmetries in phonology: complexity and visibility. *Phonology*, 15(3):317-352.
- Fernandes-Svartman, F., Abaurre, M. B., and González-López, V. A. (2008). Acento secundário e intensidade em português brasileiro. In *Anais do 80^o Encontro do CELSUL*, pages 1-18, Porto Alegre.
- Garcia, G. D. (2014). *Portuguese Stress Lexicon*. Comprehensive list of non-verbs in Portuguese. Available at <http://guilhermegarcia.github.io/psl.html>.
- Garcia, G. D. (2017). Weight gradience and stress in Portuguese. *Phonology*, 34(1):41-79.
- Gordon, M. (2006). *Syllable weight: phonetics, phonology, typology*. Routledge, New York.
- Hualde, J. I. and Nadeau, M. (2014). Rhetorical stress in Spanish. In van der Hulst, H., editor, *Word stress: theoretical and typological issues*, pages 228-254. Cambridge University Press, Cambridge.
- Lehiste, I. (1965). The function of quantity in Finnish and Estonian. *Language*, 41(3):447-456.
- Major, R. C. (1985). Stress and rhythm in Brazilian Portuguese. *Language*, 61(2):259-282.
- Moraes, J. a. (2003). Secondary stress in Brazilian Portuguese: perceptual and acoustic evidence. In *XVth ICPHS*, pages 2063-2066, Barcelona.
- Pater, J. (2000). Nonuniformity in English secondary stress: The role of ranked and lexically specific constraints. *Phonology*, 17(2):237-274.
- Tang, K. (2012). A 61 million word corpus of Brazilian Portuguese film subtitles as a resource for linguistic research. *UCL Working Papers in Linguistics 24: 208-214*.
- Wetzels, W. L. (2007). Primary word stress in Brazilian Portuguese and the weight parameter. *Journal of Portuguese Linguistics*, 5:9-58.

Durational differences

Initial vs. peninitial

