

Is there reduction via laxing in northern dialects of Brazilian Portuguese?

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INTRODUCTION

Reduction as a **contrast-enhancement** mechanism in OT:

- LIC-NONCORNER/STRESS (Crosswhite, 1999);
- N-WAYCONTRAST, SPACEF1 \geq N (Padgett, 1997).

Reduction as a **prominence alignment** mechanism:

- *a/ǝ >> *ε, ɔ/ǝ >> *e, o/ǝ >> *i, u/ǝ (Crosswhite, 1999)
- *i, u/ǝ >> *e, o/ǝ >> *ε, ɔ/ǝ >> *a/ǝ (Kenstowicz, 2010)

Reduction via tensing is predictable and expected. However, previous claims regarding a pattern of reduction via laxing in BP motivate three questions:

- 1) Is there really reduction via laxing in northern dialects of BP?
- 2) How can this be accounted for?
- 3) What are the theoretical implications of such a pattern?

BACKGROUND AND METHODS

Vowel System in Brazilian Portuguese

- a) Stressed (ó) : /i, e, ε, a, ɔ, o, u/
- b) Unstressed word-final (σ_w) : /i, a, u/
- c) Unstressed word-internal

Word-initial syllables (σ₁)
Pretonic bearing secondary stress (σ)
Non-final Postonic (σ_{NFP})
Pretonic syllables (ǝ)

Non-final Postonic (σ_{NFP}) (Santana, 2016)

- Lax-mid vowels are the result of regressive harmony (eg. 'paw.pε.bra eyelid);
- Tense-mid vowels result of mid-vowel neutralization (eg. 'tʃi.ke.tʃi ticket)

Word-initial syllables (σ₁)

- 20 speakers of BP's x 56 words in carrier sentence x randomly repeated 3x.
- ANOVA (F1 value) and Chi-square (category assigned by investigator).

RESULTS

Front vowels			Back vowels		
[ε]	[e]	[i]	[ɔ]	[o]	[u]
55%	41,7%	3,3%	59,8%	39,1%	1,1%
Total: 1680 tokens			Total: 1680 tokens		

- Lax-mid are more frequent than tense-mid vowels.
eg. [xε.'viʃ.te] 'magazine'
[xε.'viʃ.te]

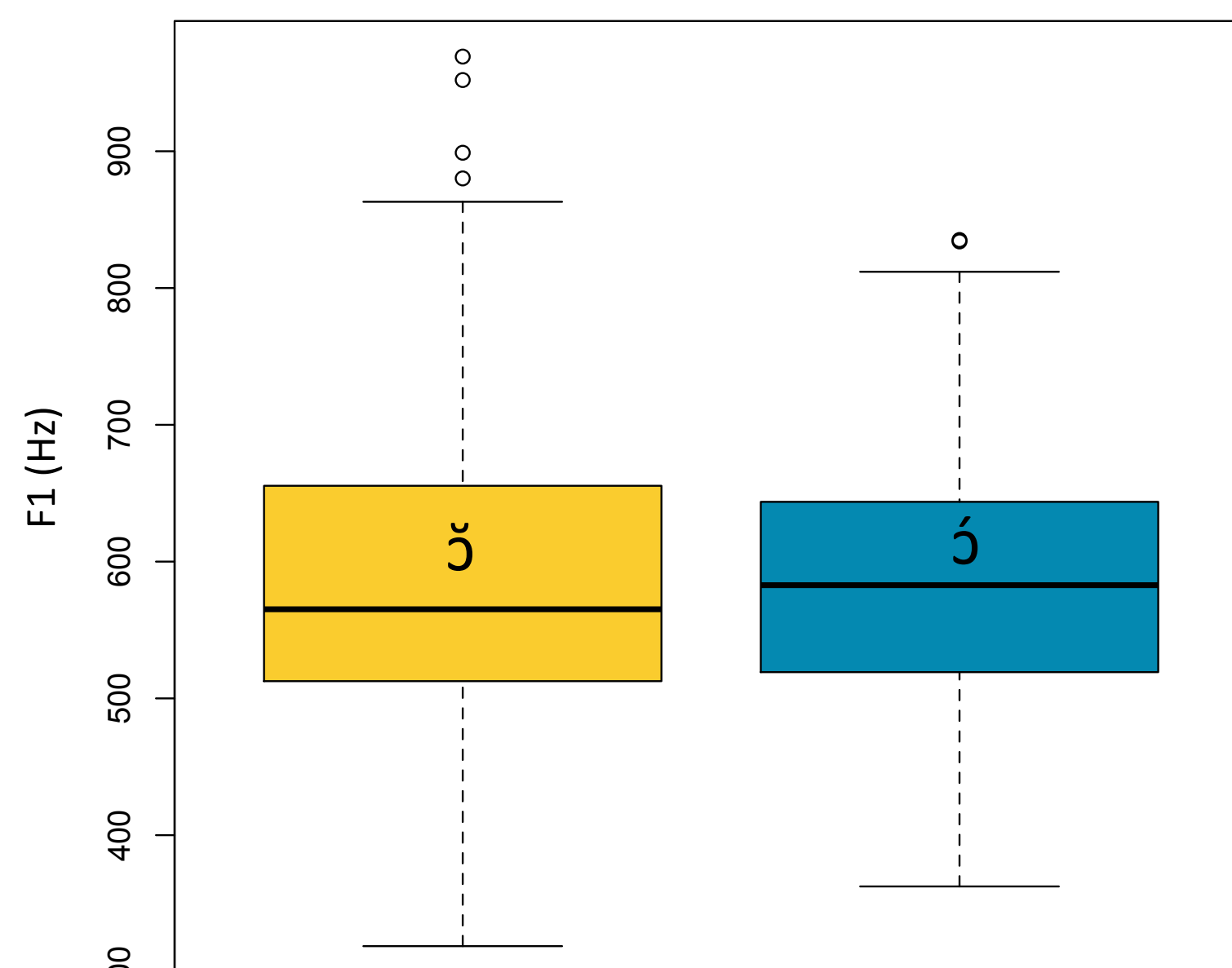
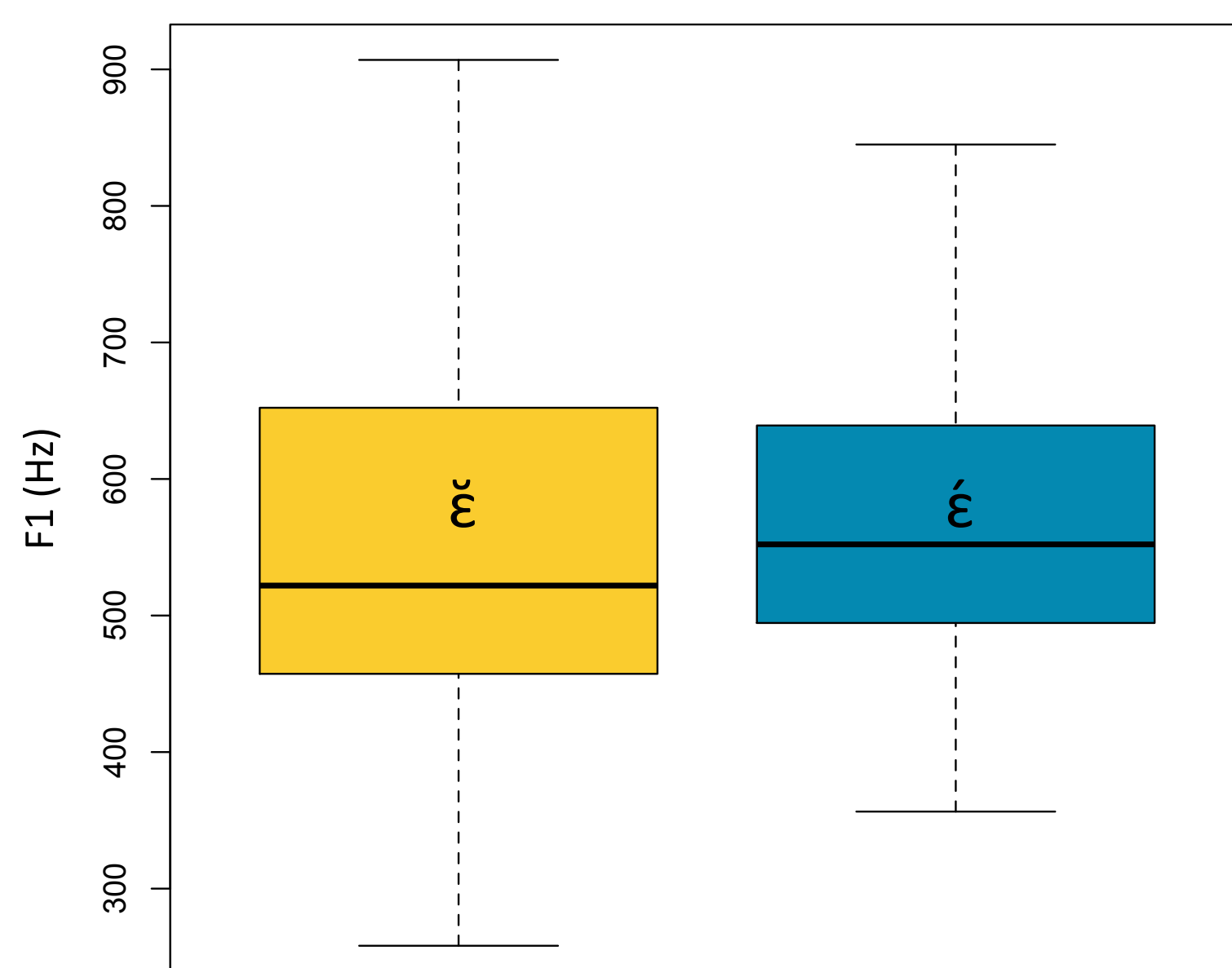
[+atr]_{σ1} was produced more significantly when followed by [+atr]_{σ1}. A patten among exceptions was found:

	Stressed	Pretonic			Pretonic		
		[ε]	[e]	[i]	[ɔ]	[o]	[u]
high		36%	63,8%	0,2%	45,8%	53,3%	0,9%
tense		28,6%	71,4%	0%	13%	86,2%	0,8%
lax		95,4%	4,6%	0%	95%	5%	0%
low		58,3%	23,7%	18%	81,4%	15,7%	2,4%
		Total: 1680 tokens			Total: 1680 tokens		
		p-value < 0.001			p-value < 0.001		

- [e] in σ₁ with [ε, ɔ, a] in (ó) occurred when followed by [ʃ] in coda. (eg. eʃ'taka 'stake')

	[é, ɔ]	[á]	total		[é, ó]	[í, ú]	total
[e]	22	10	= 32	[ε]	173	120	= 293
[o]	18	37	= 55	[ɔ]	165	65	= 230

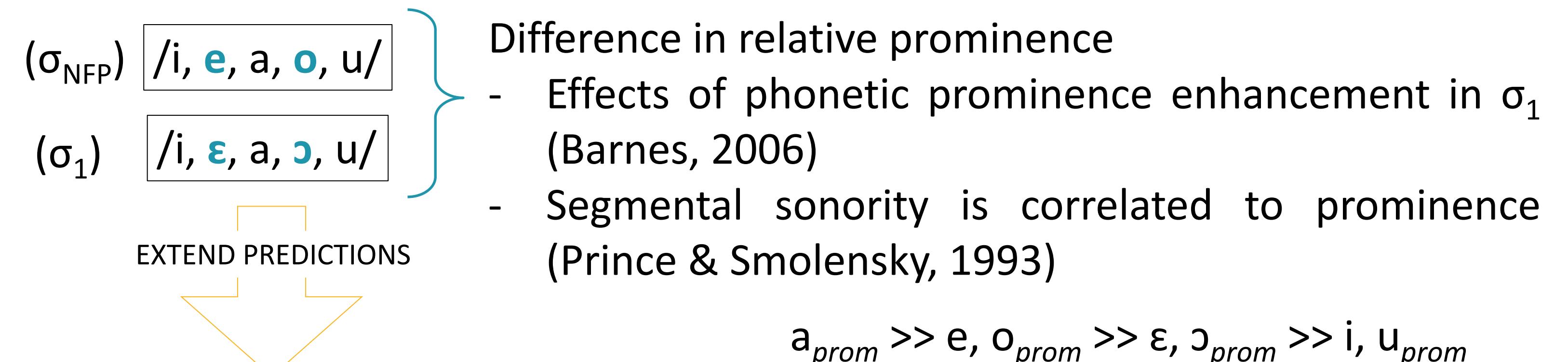
- No significant difference between [-atr]_{σ1} e [-atr]_ó (Paired t-test. p-value = 0.9)



CLAIM

σ_{NFP} : 'kẽ.mε.ra 'camera'; *'tʃi.kε.tʃi 'ticket'; 'ẽ.'kɔ.ra 'anchor'; *po.'li.gɔ.nu 'polygon'
σ₁ : ze.'lo.zu 'careful'; *xes.'pɔʃ.ta 'answer' goʃ.'to.zu 'tasty'; *ko.'lɛ.ga 'colleague'

[e, o] result from [atr] harmony. [ε, ɔ] are the result of mid-vowel neutralization.



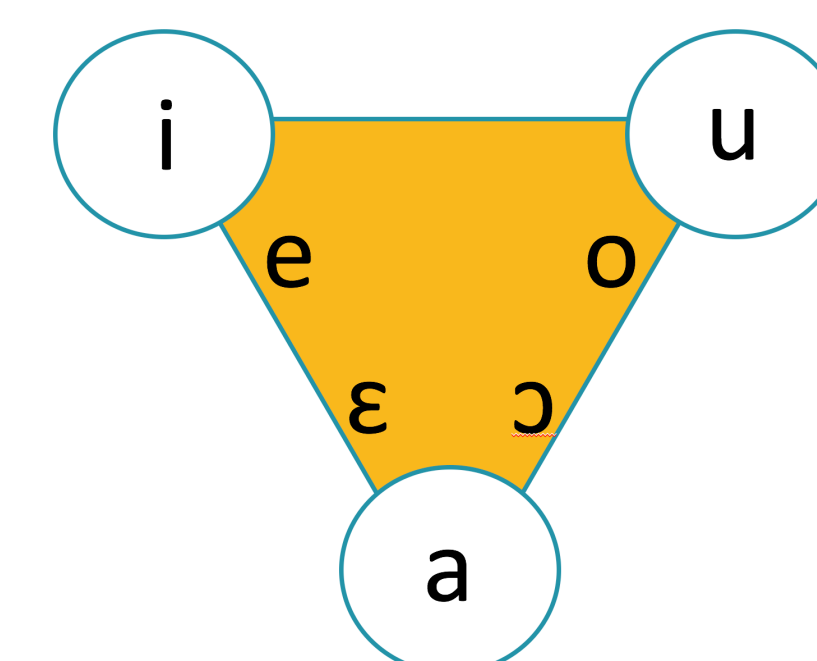
(σ_{NFP}) (ǝ)
/i, e, a, o, u/

(σ₁) (σ)
/i, ε, a, ɔ, u/

Mid vowels are selected due to prominence alignment constraints

FORMALIZATION

Reduction via laxing results from an interaction between contrast enhancement and prominence alignment types of neutralization.



- Corner vowels are protected due to Contrast enhancement constraints

- LIC-NONCORNER/STRESS do not have this ability: Corner vowels are not protected. Mid vowels are penalized.

N-way contrast: maintain a number *n* of contrasts

Space Constraints: any two segments contrasting in F1 differ by at least 1/nth of the full F1 range (Padgett, 1997)

		3-way Cont.	Space F1 \geq 3	4-way Cont.
i	a			
i	ε	a		
i	e	ε	a	
a.	i, a	*!W	L	*
b.	i, ε, e, a		**!*W	L
c.	i, e, a		*	*
d.	i, ε, a		*	*

- Prominence alignment selects [ε, ɔ] in more prominent contexts and [e, o] in less prominent contexts with inverse ranking.

	*{i, u}/σ ₁	*{e, o}/σ ₁	*{ε, ɔ}/σ ₁	*{a}/σ ₁
a. i, ε, a	*		*	*
b. i, e, a	*	*!W	L	*

- Higher ranked constraints driving harmony capture the overall tendency

THEORETICAL IMPLICATIONS

- Reduction via laxing in BP shows that the contrast enhancement mechanism must be formalized by making reference to corner vowels as a set due to their contrastive power, not by penalizing mid vowels for their non-contrastive ability.
- Further question: how does maximizing contrast constraints deal with the typology of vowel reduction?

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