

# Native and Non-Native Patterns in Conflict: Lexicon vs. Grammar in Loanword Adaptation in Brazilian Portuguese



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## 1 Introduction

- Crosslinguistically, loanword adaptation is constrained by two opposing forces: **faithfulness to the source** and compliance with the **phonotactic requirements** of the borrowing language (see e.g., LaCharité & Paradis 2005; Kang 2011).
- This poster discusses a case of loanword adaptation in Brazilian Portuguese (BP) where **the lexicon and the grammar behave differently** with regard to faithfulness to the source and phonotactic violations.

### 1.1 The data

- In BP, English loanwords with /ʌ/ are normally produced with [ɐ]; see (1).

(1) a. *pub* → ['pɐbi], *bug* → ['bɛgi]  
b. *funk* → ['fɛ̃ki], *punk* → ['pɛ̃ki]

- In the BP inventory, [ɐ] is articulatorily the closest vowel to /ʌ/.
- However, [ɐ] is an allophone for /a/ and **only appears before nasal consonants**; compare (2a) with (2b).

(2) a. *casa* ['kaza], \*['keza] 'house'  
b. *cama* ['kɛ̃ma], ['kama] 'bed'; *canto* ['kɛ̃to], \*['kãto] 'corner'

- Given the native BP inventory:
  - it is **not surprising** that [ɐ] is licensed in the items in (1b);
  - it is **surprising** that [ɐ] is licensed in the items in (1a).

### 1.2 Questions

**Is the ability to license [ɐ] in more contexts in loanwords than in native words part of the BP grammar?**

- Do the lexicon and the grammar of BP differ with respect to their preferred adaptation patterns?
- Lexicon-grammar asymmetries in the generalization of unnatural patterns have been attested in native languages (e.g., Becker et al. 2012, Garcia 2017, Jarosz 2017). Can such asymmetries be detected in the generalization of non-native patterns that are present in the lexicon due to borrowing?
- Two experiments were conducted to answer these questions.

## 2 Methodology

- Native speakers of BP ( $n = 15$ ) with various levels of proficiency in English participated in two production tasks.

### 2.1 Real Loanword Task

- Target items: frequent English loanwords with /ʌ/ ( $n = 26$ ).
- Procedure: Participants read newspaper headlines and then repeated them while staring at a blank screen.

### 2.2 Nonce Loanword Task

- Target items: Nonce loanwords containing /ʌ/ ( $n = 20$ ).
- Procedure: Items were presented auditorily; participants produced the items twice in carrier sentences in BP.

## 3 Data

- Participants' productions in both tasks were coded for vowel quality; coding was based on F1, F2 and F3 measurements and the judgements of a linguist.
- Overall, participants used [ɐ] **consistently more in the Real Loanword Task**.
- When the target **vowel was followed by a nasal consonant** (*funk*, *tump*), it was predominantly produced as [ɐ].

- When the target **vowel was followed by an oral consonant**, it was produced as [ɐ] much more frequently when the item was a real loanword (*bug*) than when it was a nonce loanword (*vup*).

- In Figure 1, *other* indicates all non-[ɐ] productions; see section 3.1 below.

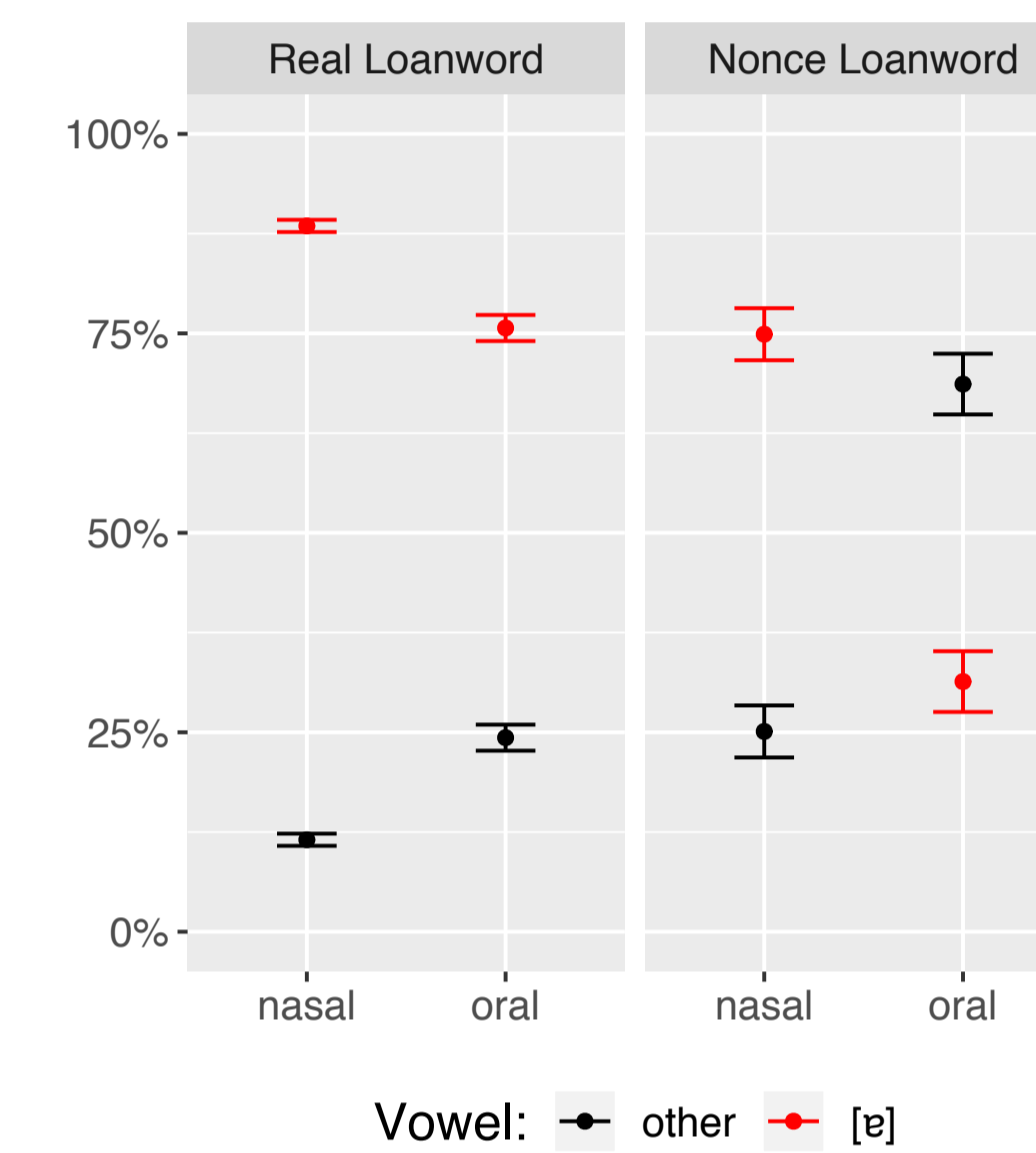


Figure 1: Proportion of [ɐ] by task and context

- The data in Figure 1 were modelled with a hierarchical logistic regression with by-speaker random slopes for task and context (oral and nasal).
- Production of [ɐ] is **significantly dispreferred in oral contexts and nonce loanwords** ( $\hat{\beta} = -1.62$ ,  $p < 0.0001$ ).
- Participants' proficiency in English is not significant ( $\hat{\beta} = 0.12$ ,  $p < 0.63$ ).

### 3.1 Non-[ɐ] outputs

- In the **Real Loanword Task**, the majority of *other* segments are [u].
  - This is not surprising given Portuguese orthography, where letter *u* = [u].
- In the **Nonce Loanword Task**, *other* segments:
  - are mostly [u] in nasal contexts.
  - can be [u] (11.7%), [ɔ] (20.6%), [a] (36.1%) in oral contexts.

– Proportion of [ɐ]: 31.6 %.

- The use of [u] can be explained based on participants' knowledge of sound-letter correspondence patterns in English.
- The use of [ɔ] can be explained based on the acoustic similarities between English [ʌ] and BP [ɔ].
- The use of [a] can be accounted for based on speakers' avoidance of [ɐ] in non-native contexts; see (2).

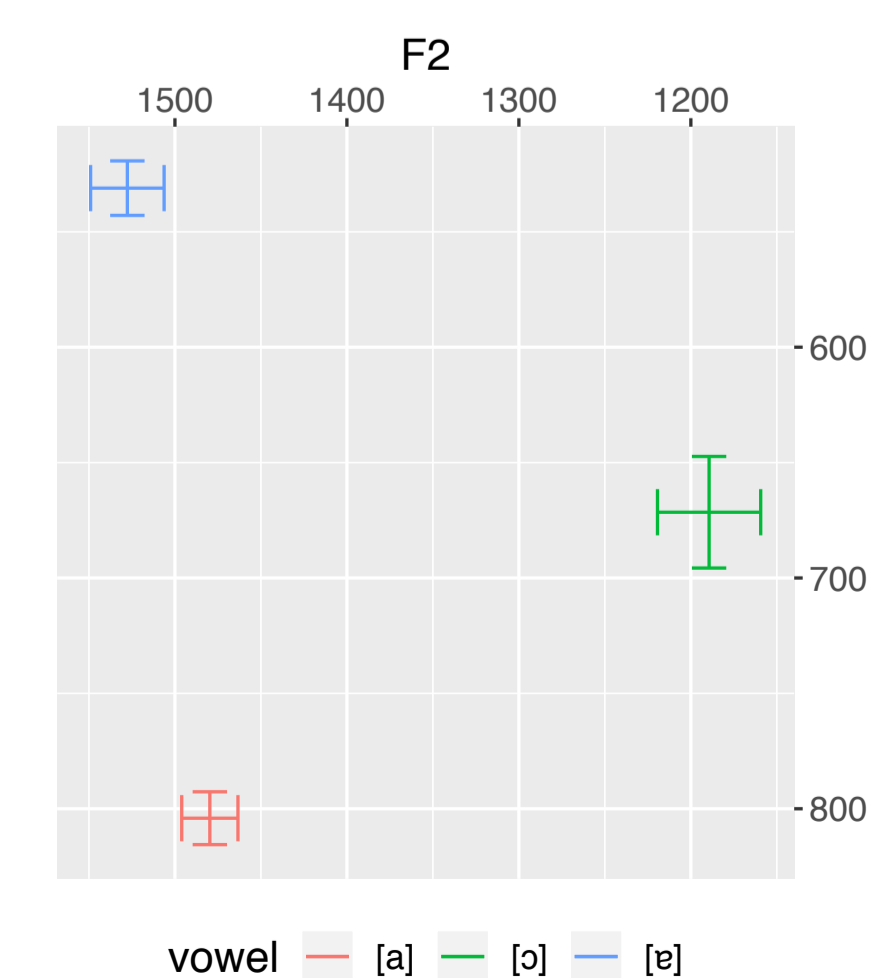


Figure 2: Vowels produced in oral context

• **Mismatch between the source language and the borrowing language motivates the use of different adaptation strategies in oral contexts:**

- English /ʌ/ is found before both nasal and oral consonants; BP ([ɐ]) is licensed only before a nasal consonant.
- Most frequent adaptation strategy (/ʌ/ → [a]) is consistent with the distribution of [ɐ] and [a] in BP: [ɐ] in nasal contexts, otherwise [a].
- /ʌ/ → [a] is marginal in the lexicon: *pick-up* [pi'kapi], *check-up* [ʃe'kapi].

## 4 Formalization

In oral contexts, in the Nonce Loanword Task:

- Conflict between **constraints that require faithfulness** to the input and **constraints that ban non-native patterns** → variation in output forms.
- MaxEnt (Hayes & Wilson 2008): probabilistic assessment of candidates.
- The following constraints account for the productions that are not conditioned by orthography (i.e., [a], [ɔ], [ɐ]):

FAITH: Every segment in the input is featurally identical to every segment in the output

FAITH(round): Every segment in the input is identical in [round] to every segment in the output

LICENSE-[ɐ]: [ɐ] is followed by a nasal consonant

/vap/	FAITH [0.5]	FAITH(rnd) [0.6]	LIC-[ɐ] [0.7]	actual prop	probability
'vɛpi			1	35.8	0.35
'vɔpi	1	1		23.2	0.23
'vapi	1			40.9	0.42

- The form ['vɛpi] **does not violate FAITH**: BP speakers do not have distinct representations for native and non-native segments with near identical articulation such as [ɐ] and /ʌ/ (e.g., Peperkamp & Dupoux 2003; Hsu & Jesney 2017).

## 5 Final Remarks

- Native speakers of BP generally avoid [ɐ] in nonce loanwords where the target vowel is not followed by a nasal coda, preferring [a] instead: the weight of LICENSE-[ɐ] is higher than the weight of FAITH.
- In the lexicon, where productions with [ɐ] are the norm, the weight of FAITH must be overwhelmingly higher than the weight of LICENSE-[ɐ].
- The results indicate that native speakers do not generalize non-native patterns that are present in the lexicon, mirroring what has been observed for the generalization of unnatural patterns in native grammars.

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