What Motivates High Vowel Deletion in Québec French: Foot Structure or Tonal Profile?

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Prosodic domains are identified based on the phonological processes they exhibit, e.g., prominence patterns (Nespor & Vogel 1986; McCarthy & Prince 1995). The proposal that a language lacks a given prosodic domain often relies on the absence of prominence patterns associated with that domain.
The case of the French foot:

- In both European and Québec French, the only obligatory position of prominence is the right edge of the phonological phrase (PPh) (see Jun & Fougeron 2000 for EF; Thibault & Ouellet 1996 for QF)
- This led to the assumption that French has no foot structure (Jun & Fougeron 2000)
Introduction

The case of the French foot:

- French: different from languages in which stress is computed in the phonological word (PWd) and realized in the foot, such as English

- English: $[(\text{ævə})_{\text{Ft}}(\text{'kəvə})_{\text{Ft}}\text{dəv}]_{\text{PWd}}$ ‘avocado’

- French:

  $\begin{array}{c}
  (H) \\
  \mid \mid \\
  \text{lə mɔvɛz} \quad \text{avc̥ka}
  \end{array}$

  ‘the bad avocado’
Introduction

- The foot: present in English, absent in French

Diagram:

```
PPh  Phonological Phrase
    |
    PWd Phonological Word
    |
    Ft  Foot
    |
    σ   Syllable
```
Possibility: Footing in Québec French (QF) is not motivated through prominence, but through the application of segmental processes (esp. ‘weakening’ processes)

Verluyten (1982): High Vowel Deletion (HVD) in QF is sensitive to alternating rhythmic structure

- **alimentation**
  - ‘nourishment’

- **organisateur**
  - ‘organizer’
Verluyten (1982) did not test this hypothesis empirically.

Cedergren (1986): sociolinguistic data did not support Verluyten’s hypothesis.

Guzzo, Goad & Garcia (2016), Garcia, Goad & Guzzo (2017) (henceforth GGG) tested native speakers’ judgements on HVD in QF:

- Results support Verluyten’s hypothesis.
High Vowel Deletion in QF

GGG’s experiment:

- **Items:**
  - Target vowel: [i]
  - 2-6-syllable words \((n = 355)\), with deletion or non-deletion
  - [i] never deleted word-finally, in closed syllable or following branching onset

- **Task:**
  - Words presented orthographically and auditorily
  - Participants had to judge if the word they heard was pronounced in a natural way
  - Scale from 1 to 5

- **Participants:** Native speakers of Québec French \((n = 10)\)
High Vowel Deletion in QF

Observations from GGG’s experiment:

- HVD preferred in even-numbered syllables from the right word edge:

HVD preferred
kõ(b∅.ne) ‘to combine’
ma(n∅.fεs)(ta.sjõ) ‘demonstration’

HVD dispreferred
ɔr(ga.n∅)(za.tœr) ‘organizer’
(ka.p∅)(ta.li)(za.sjõ) ‘capitalization’

*Results based on hierarchical logistic regressions with by-speaker and by-item random intercepts
High Vowel Deletion in QF

GGG’s conclusion:

▶ HVD is preferred in foot-dependent position
▶ Motivation for iterative iambic footing
Additional observation from GGG’s experiment:

- **HVD dispreferred in word-initial position, independent of footing:**

  \( (f\emptyset.l\varepsilon) \quad \text{‘net’} \)

  \( v\emptyset(zi.t\varepsilon\theta) \quad \text{‘visitor’} \)

  \( (f\emptyset.na)(li.te) \quad \text{‘finality’} \)
Present study

- Is it possible that HVD in QF is conditioned by another predictor?
- GGG’s experiment only tested isolated words: the possibility that HVD is conditioned by phrasal prominence cannot be rejected
  - HVD could be constrained by the location of the optionally-realized phrase-initial H-tone in French (on initial H-tone, see e.g., Dell 1984, Jun & Fougeron 2000)
  - This would explain speakers’ dispreference for initial deletion
Hypothesis

- HVD in QF is affected by the tonal profile of the phonological phrase:
  - Deletion is **dispreferred** when a high vowel appears in the **first syllable of the first lexical word in a phrase**, since this is the optimal location for the initial H-tone to be realized.
Methods

- Stimuli:
  - 120 2- and 4-syllable nouns with/without deletion of [i] word-initially
  - 3 types of phrases:
    a. No determiner (N):
       - viżaẓ ‘face’
       - vižitasjō ‘visitation’
    b. Determiner + noun (DN):
       - lə viزاẓ ‘the face’
       - lə vižitasjō ‘the visitation’
    c. Determiner + adjective + noun (DAN):
       - lə jəli viзаẓ ‘the beautiful face’
       - lə jəli vižitasjō ‘the beautiful visitation’
Methods

Task:
- Phrases presented orthographically and auditorily
- Participants had to judge if the phrase they heard was pronounced in a natural way
- Scale: 1 = completely unnatural; 4 = completely natural

Participants: Native speakers of Québec French (n = 12)
Predictions

- **4-syllable nouns:**

  a. H  H*
      ↓  ↓
     la jøli vØzitasjø

  b. H  H*
      ↓  ↓
     la vØzitasjø

  c. H  H*
      ↓  ↓
     vØzitasjø

1. HVD should be favored in DAN (a): H falls on the adjective’s first syllable with the noun’s first syllable being prosodically weaker

2. HVD should be disfavored in DN (b) and N (c) because the targeted vowel is in the syllable where H should fall

3. If there is a difference between (b) and (c), HVD should be favored in (b), i.e., when the high vowel is not in absolute initial position
Predictions

- **2-syllable nouns:**

  d. \( \text{H} \quad \text{H}^* \)  
  lə jɔli \( \) vØza\( \tilde{a} \)  

  e. \( \text{H}^* \)  
  lə vØza\( \tilde{a} \)  

  f. \( \text{H}^* \)  
  vØza\( \tilde{a} \)

4. HVD should be equally favored in DAN, DN and N (d, e, f); in (e) and (f), optional initial H cannot be realized due to clash, so HVD should be natural.

5. If there is a difference between (e) and (f), HVD should be favored in (e), i.e., when the high vowel is not in absolute initial position.
Predictions

**Tonal Hypothesis – Summary:**

- \( \text{la joli } \varnothing \text{zitasjō} > \text{la } \varnothing \text{zitasjō} = \varnothing \text{zitasjō} \)
- \( \text{lə joli } \varnothing \text{za3} = \text{lə } \varnothing \text{za3} = \varnothing \text{za3} \)
- \( \text{la joli } \varnothing \text{zitasjō} = \text{lə joli } \varnothing \text{za3} \)
- Possibility: \( \text{la } \varnothing \text{zitasjō} > \varnothing \text{zitasjō}, \text{lə } \varnothing \text{za3} > \varnothing \text{za3} \)

**Footing Hypothesis:**

- Since the target vowel is in foot-dependent position in all contexts, there should be no difference between any of the phrase types, nor between 2- and 4-syllable nouns
Results

Fig. 1: HVD preference by number of syllables and type of phrase

Number of syllables: 2

% of 'Good' responses (3-4)

Number of syllables: 4

% of 'Good' responses (3-4)
Results

- The data were modeled with hierarchical logistic regressions with by-speaker and by-item random intercepts
- **General model:** \( \text{response} \sim \text{numberOfSyll} \times \text{typeOfPhrase} \)
- **Specific models:**
  - **2-syllable nouns:** \( \text{response} \sim \text{typeOfPhrase} \)
  - **4-syllable nouns:** \( \text{response} \sim \text{typeOfPhrase} \)
Results

![Bar chart showing HVD preference by number of syllables and type of phrase. The chart compares 2-syllable and 4-syllable nouns with different phrase types (N, DN, DAN).](image)

**Unexpected result 1:**

- HVD in 4-syllable nouns is rated significantly better than in 2-syllable nouns ($\hat{\beta} = 1.4$, $z = 2.55$, $p = 0.01$)

**Unexpected result 2:**

- Phrase type is **not** significant for 4-syllable nouns

**Expected result:**

- Phrase type is **not** significant for 2-syllable nouns
Results

- **Unexpected result 1:** HVD in 4-syllable nouns is rated significantly better than in 2-syllable nouns

- **Possible explanation:**
  - HVD is constrained by word length, given that longer words are spoken more quickly (Lehiste 1970; Natatani, O’Connor & Aston 1981; for French, see Malécot, Johnson & Kizziar 1972).
  - HVD, as a weakening process, should apply more frequently as word length increases.

- If this is the case, deletion and retention should yield inverse preferences: the percentage of good responses with no HVD should be lower for 4-syllable than for 2-syllable nouns
  - HVD in 4-syllable nouns > HVD in 2-syllable nouns
  - HV retention in 4-syll nouns < HV retention in 2-syll nouns
Results

- **Unexpected result 1:** HVD in 4-syllable nouns is rated significantly better than in 2-syllable nouns

- But no statistical difference for high vowel retention between 2- and 4-syllable nouns

- **HVD and HV retention are regulated by something else, not word length**
Results

- Alternative explanation for this unexpected result:
- Iterative footing regulates HVD (following GGG’s proposal)
- But HVD is *dispreferred when it targets the head foot*
Results

- HVD in initial position is dispreferred when it targets the head foot (Hd-Ft)

\[
\begin{align*}
\text{a.} & & \text{b.} \\
H & & H^* \\
\text{lē (jôli)}_{\text{Ft}} & (\text{vûza3})_{\text{Hd-Ft}} & \text{lā (jôli)}_{\text{Ft}} (\text{vûzi})_{\text{Ft}} (\text{tasjô})_{\text{Hd-Ft}}
\end{align*}
\]

- HVD is worse in (a) than in (b) because the phrase-final foot in the former is the head foot: its final syllable coincides with the obligatory phrasal prominence (H*)
Results

- Other results are also compatible with a foot analysis:

- **Unexpected result 2:** Phrase type is not significant for 4-syllable nouns
  - Initial deletion in 4-syllable nouns is in foot-dependent position
  - The initial foot in 4-syllable nouns is not the head foot

- **Expected result:** Phrase type is not significant for 2-syllable nouns
  - Initial deletion in 2-syllable nouns always targets the head foot
Summary and Final Remarks

- Previous hypothesis: High Vowel Deletion motivates iterative iambic footing in Québec French
  - Guzzo, Goad & Garcia (2016, 2017): previous experiment included only isolated words

- Current hypothesis: HVD is constrained by optional phrase-initial H tone

- In a judgement task including 2- and 4-syllable nouns with HVD in initial position in 3 types of phrases, HVD is rated better in 4-syllable nouns, regardless of phrase type

- Conclusions:
  - No evidence for phrase-initial prominence effects on HVD
  - Footing regulates HVD, but deletion is dispreferred in the head-foot


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