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

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Introduction

- 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: 

\[ ([\text{'ævə})_{\text{Ft}}('kɔː')_{\text{Ft}}\text{dɔv}]_{\text{PWd}} \]

\text{‘avocado’}

- French:

\[ \begin{array}{c}
(H) \\
| \\
\text{lə mɔvɛz} \\
| \\
\text{aνɔka} \\
\text{‘the bad avocado’}
\end{array} \]
Introduction

- The foot: present in English, absent in French
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

\[
\begin{array}{cccc}
\checkmark & s & w & s \\
\checkmark & a & \emptyset & m\ddot{a} & t & a & s & j\ddot{o} \\
\end{array}
\]

\textit{alimentation}  
‘nourishment’

\[
\begin{array}{cccc}
\times & s & w & s \\
\times & o & r & g & a & n\emptyset & z & a & t & o & e & r \\
\end{array}
\]

\textit{organisateur}  
‘organizer’
High Vowel Deletion in Québec French

- 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
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       | HVD dispreferred                      |
|---------------------|---------------------------------------|
| kõ(b∅.ne) ‘to combine’ | or(ga.n∅)(za.tøer) ‘organizer’        |
| ma(n∅.fės)(ta.sjõ) ‘demonstration’ | (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:

  \[(f\emptyset.l\emptyset)\quad\text{‘net’}\]
  \[v\emptyset(z\!i.t\!o\!r)\quad\text{‘visitor’}\]
  \[(f\emptyset.na)(l\!i.t\!e)\quad\text{‘finality’}\]
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):
     - vīzaŋ ‘face’
     - vīzitasjō ‘visitation’
  b. Determiner + noun (DN):
     - lə vīzaŋ ‘the face’
     - la vīzitasjō ‘the visitation’
  c. Determiner + adjective + noun (DAN):
     - lə jəli vīzaŋ ‘the beautiful face’
     - la jəli vīzitasjō ‘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. \( H \quad H^* \quad \text{la jólí vØzitasjõ} \)
  b. \( H \quad H^* \quad \text{la vØzitasjõ} \)
  c. \( H \quad H^* \quad \text{vØzitasjõ} \)

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:**

  
  \[
  \begin{align*}
  \text{d. } & \quad \text{H} \quad \text{H*} \\
  & \quad \text{lə jəli} \quad \text{vØza3} \\
  \text{e. } & \quad \text{H*} \\
  & \quad \text{lə vØza3} \\
  \text{f. } & \quad \text{H*} \\
  & \quad \text{vØza3}
  \end{align*}
  \]

  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:

- la joli vøzitasjõ > la vøzitasjõ = vøzitasjõ
- lə jəli vøzaə = lə vøzaə = vøzaə
- la jəli vøzitasjõ = lə jəli vøzaə
- Possibility: la vøzitasjõ > vøzitasjõ, lə vøzaə > vøzaə

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 | Number of syllables: 4 |
|------------------------|------------------------|
| % of ‘Good’ responses (3–4) |
| N | DN | DAN | N | DN | DAN |
| 0% | 20% | 40% | 60% | 80% |

Guzzo, Goad & Garcia
Results

▶ The data were modeled with hierarchical logistic regressions with by-speaker and by-item random intercepts
▶ **General model:** response $\sim$ numberOfSyll * typeOfPhrase
▶ **Specific models:**
  - **2-syllable nouns:** response $\sim$ typeOfPhrase
  - **4-syllable nouns:** response $\sim$ typeOfPhrase
Results

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

| Number of syllables: 2 | Number of syllables: 4 |
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| % of 'Good' responses (3-4) |
| N | DN | DAN |
| 0% | 20% | 40% |
| N | DN | DAN |
| 60% | 80% |

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 $>\text{HVD in 2-syllable nouns}$
  - HV retention in 4-syll nouns $<\text{HV retention in 2-syll nouns}$
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)

  a. \( H \quad H^* \)
  \[ \text{la (jəli)}_{Ft} \quad (v∅za3)_{Hd-Ft} \]

  b. \( H \quad H^* \)
  \[ \text{la (jəli)}_{Ft} \quad (v∅zi)_{Ft} (tasj5)_{Hd-Ft} \]

- 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 Québécois 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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