

## Contrasting Community and Individual Grammars in Laurentian French Laxing

Jeffrey Lamontagne (Indiana University Bloomington)

**Introduction.** In Laurentian French (also called Canadian or Quebec French), high vowels are subject to a large number of processes that affect their tenseness (tense/lax realization; e.g. Côté, 2008; Dumas, 1987; and Poliquin, 2006). In word-final syllables, high-vowel tenseness is categorical within the lexicon and can be describe with two obligatory rules: high vowels lax in closed syllables (e.g. [vit] *vite* ‘quick’), and are retensed when followed by a non-rhotic word-final trigger for lengthening (e.g. [vi:z] *visé* ‘targets’). However, non-final syllables have challenged attempts at theoretical description (but for earlier accounts, see Bosworth, 2011; Fast, 2008; and Poliquin, 2006). The challenges stem from both data limitations (perceptual acceptability judgments collected by Poliquin (2006) rather than production data) and the highly complex nature of the grammar (optionality, opacity, and apparent inter-speaker variability).

The current paper addresses variable tenseness in non-final syllables by leveraging categorical final-syllable tenseness to train an aligner to distinguish tenseness in spoken Laurentian French. The resulting corpus therefore provides the first large-scale dataset to elucidate both (a) the community-level grammar across speakers and (b) individual speakers’ grammars. We show that individual grammars may differ considerably from the community-level grammar a speaker is expected to use as input, but that individual speakers nonetheless have sufficient input to generate a grammar (contra Poliquin, 2006) and that speakers produce coherent grammars that fall on a spectrum (namely harmony and the relationship with prominence) rather than being fully idiosyncratic (partly contra Poliquin, 2006).

**Methods.** A forced aligner was trained on categorical final syllables to distinguish tense and lax realizations of high vowels, and then classified the tenseness of high vowels in non-final syllables. The use of production data is crucial because acceptability may reflect exposure to other grammars in addition to consistency with individual grammars, as suggested by Poliquin (2006) finding individual speakers frequently accepted productions consistent with multiple grammars. The corpus consists of 131 speakers producing a total of 24 336 high vowels in non-final syllables. Community and individual grammars were generated using decision trees and mixed-effects logistic regression, producing grammars similar to those found in MaxEnt Optimality Theory, with the advantage that decision trees offer a pruned set of factors (allowing us to examine only significant factors and their hierarchical importance for a learner) while regression quantifies the importance of individual factors with more precision.

**Community-Level Results.** Combining all input that a learner may receive, it is possible to determine what we might expect a learner to generate as a grammar of tenseness in Laurentian French. Concerning optional processes discussed in the literature (namely Poliquin, 2006):

- i. **Closed-Syllable Laxing.** Speakers *do* significantly prefer to lax high vowels in closed non-final syllables (e.g. /**mis.tɛʁ**/ *mystère* ‘mystery’).
- ii. **Laxing Disharmony.** Speakers *do not* significantly prefer to lax the initial-syllable high vowel of a CVCV word ending in a tense high vowel (e.g. /**mi.di**/ *midi* ‘noon’).
- iii. **Laxing Harmony.** Speakers *do* significantly prefer to produce two types of harmony at the community level: (a) right-to-left iterative harmony in which neutral (i.e. non-high) vowels are transparent, and (b) non-local harmony whereby initial-syllable high vowels match final-syllable high vowels in tenseness regardless of intervening sounds.

**Individual Results.** Based on 12 speakers' perception judgments, Poliquin (2006) proposed that speakers converge on one of four discrete grammars of high-vowel laxing due to insufficient evidence from words of three or more syllables (i.e. poverty of the stimulus). He concludes there are four harmony patterns that capture laxing in non-final open syllables: (a) no laxing harmony, (b) harmony whereby final-syllable laxing triggers harmony only in the penult, (c) harmony whereby final-syllable laxing triggers laxing harmony only in the final syllable, or (d) harmony whereby final syllables trigger laxing in the preceding syllable and laxing harmony iterates across the word (with non-high vowels optionally behaving transparent or opaque). Speakers in his study frequently accept pronunciations from other patterns than their preferred harmony pattern in perception and furthermore finds exceptional cases where realizations that he deemed to be impossible to generate in a grammar.

Results from the present study of production suggest that speakers do acquire distinct grammars, which include the laxing harmony patterns proposed by Poliquin (2006). We additionally confirm that many (but not all) speakers produce opaque surface forms whereby retensing from various sources obscures the trigger for laxing harmony. However, regression results suggest that the harmony patterns described by Poliquin are not mutually exclusive within speakers; instead, speakers fall on a spectrum with respect to the size of effect for each harmonic trigger. Furthermore, two additional grammars emerge, as is most evident in the decision trees. In addition to closed-syllable laxing and laxing harmony, many speakers favour laxing in open initial syllables, and some speakers appear to have footing-based laxing whereby high vowels in prosodically weak syllables lax (suggesting laxing is a form of reduction or centralization for these speakers, which also predicts Laxing Disharmony). Finally, results show that many speakers have right-to-left harmony that does not require the trigger syllable to have been base-final at any level of morphological structure (as expected by Poliquin), suggesting that laxing harmony is not prosodically motivated for all speakers.

**Discussion.** The current study shows that speakers infer different grammars from highly variable input, even when there are detectable patterns in that input. Crucially, comparing effects of factors across speakers suggests that speakers still fall on a spectrum for different factors even when the grammar combines opacity, optionality, and neutrality. The net result, however, is that individual speakers' grammars are best captured as being dominated by different considerations. In this paper, we further discuss the individual grammars and how they relate to the broader community-level grammar. Many words additionally exhibit idiosyncratic behavior, suggesting that they are learned with specific tenseness values independent of the generalizations found (suggesting the possibility of ongoing phonologization of high-vowel tenseness in the variety or the presence of Exemplar Theoretic representations for frequent words).

## References.

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