

The contrastive scope of [±tense] in Laurentian French

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1. Overview

Ingredients:

- i. Modified Contrastive Specification based on the Successive Division Algorithm (Dresher *et al.* 1994; Dresher 2009) and the Activity Principle (Dresher 2015, 2016)
- ii. The phenomenon at issue in Laurentian French: allophonic laxing of high vowels, feeding a process of laxing harmony (Walker 1984; Poliquin 2006)
- iii. Additional insights into the phonology and the feature system from Jakobson & Lotz (1949); Burstynsky (1968); St-Amand (2012)

Result:

The [±tense] contrast in Laurentian French has scope over the high vowels, and so laxing harmony does not involve the propagation of a non-contrastive feature.

2. Modified Contrastive Specification

- ▶ Phonology cares about contrastive features (Hall 2007; Dresher 2009, 2015, 2016).
- ▶ The strongest version of this hypothesis predicts that redundant features should never be phonologically active.

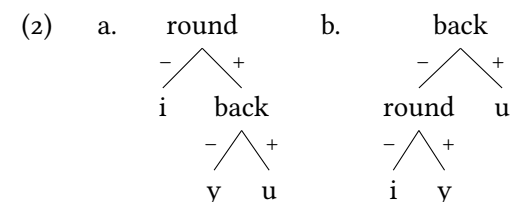
- ▶ (Other versions introduce redundant features in the course of the phonological computation (Halle 1959; Archangeli 1984), or make them parametrically visible or invisible to particular phonological rules (Nevins 2010).)
- ▶ How do we know which features are contrastive?

(1) Successive Division Algorithm (SDA; Dresher 2009: 16)

- a. Begin with *no* feature specifications: assume all sounds are allophones of a single undifferentiated phoneme.
- b. If the set is found to consist of more than one contrasting member, select a feature and divide the set into as many subsets as the feature allows for.
- c. Repeat step (b) in each subset: keep dividing up the inventory into sets, applying successive features in turn, until every set has only one member.

- ▶ Unlike pairwise comparison of segments (Archangeli 1988), the SDA reliably produces specifications sufficient to distinguish all members of the underlying inventory.
- ▶ There may be cross-linguistic tendencies in the ordering of features (Dyck 1995; Clements 2009), but the SDA itself does not stipulate the order of divisions.

- ▶ Languages with superficially identical inventories may assign them different representations (with different consequences for phonological patterns).
- ▶ E.g., there are two ways to specify the vowels /i y u/ using [±round] and [±back]:



- ▶ In the case of Laurentian French, Burstynsky (1968: 12–13) argues for (2b), because it identifies front /i/ and /y/ as a natural class.

(3) Assibilation of /t d/ before /i y/ (Burstynsky 1968: 13)

- a. *j'ai dit* [ʒedzi]
- b. *du pain* [dʒypɛ̃]
- c. *petit* [p(ə)tsi]
- d. *têtu* [tetsy]

- ▶ The contrastive hierarchy restricts the number and combinations of features that can be assigned in any inventory, while still allowing for cross-linguistic variation.
- ▶ The inventory alone can't tell us what features will be active, but we predict trade-offs: using one feature to mark a given contrast means we don't get to use others (Hall & Dresher 2016).

3. Lax high vowels in Laurentian French

The French vowel inventory (Fig. 1) does not contrast tense and lax high vowels, but allophonic laxing can propagate from one high vowel to another.

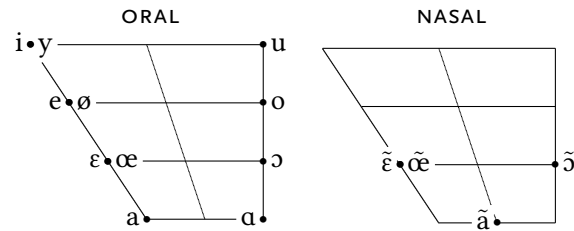


Figure 1: Vowel phonemes of Laurentian French

3.1 Closed-syllable laxing

► High vowels are predictably lax in word-final syllables closed by consonants other than the voiced fricatives /v z ʒ ʁ/.

(4) No laxing in final open syllables (Poliquin 2006: 6)

- a. *béni* [beni]
- b. *début* [deby]
- c. *dégoût* [degu]
- d. *cru* [kɾy]

(5) Laxing in final syllables closed by a C other than /v z ʒ ʁ/ (Poliquin 2006: 6)

- a. *élite* [elit]
- b. *annule* [anɥl]
- c. *égoutte* [egɔt]
- d. *arbuste* [aʁ.bɥst]

► If the coda of the final syllable contains only a voiced fricative, then a high nucleus will be tense (and long).

(6) Final syllable closed by /v z ʒ ʁ/
(Walker 1984: 56; Poliquin 2006: 102)

- a. *église* [egli:z]
- b. *Vésuve* [vezy:v]
- c. *écluse* [ekly:z]
- d. *sourd* [su:ʁ]

► Laxing is optional in non-final syllables closed by consonants other than /v z ʒ ʁ/.

(7) Optional laxing in closed non-final syllables (Poliquin 2006: 26)

- a. *mystère* [mɥs.te:ʁ] ~ [mis.te:ʁ]
- b. *binerie* [bɥn.bi] ~ [bin.bi]
- c. *bustier* [bɥs.tsje] ~ [bys.tsje]
- d. *soûlerie* [sɔl.bi] ~ [sul.bi]
- e. *moucheté* [mɔʃ.te] ~ [muʃ.te]

► Laxing (apart from harmony and dissimilation) does not apply in non-final open syllables or non-final syllables closed by /v z ʒ ʁ/.

(8) No laxing in open non-final syllables (Poliquin 2006: 7)

- a. *guidons* [gi.dɔ̃]
- b. *jumelles* [ʒy.meɛ]
- c. *coûter* [ku.te]

(9) No laxing in non-final syllables closed by voiced fricatives (Poliquin 2006: 177)

- a. *Israël* [iz.ʁa.ɛl]
- b. *fuselage* [fyz.la:ʒ]
- c. *ouzbèque* [uz.bɛk]

3.2 Laxing harmony

► Harmony (optionally) laxes a high vowel in a non-final open syllable when there is a lax high vowel in the final syllable.

(10) Harmonic laxing in non-final open syllables (Poliquin 2006: 7)

- a. *minute* [mɥ.nyɥt]
- b. *pourrite* [pɔ.ʁɥt]
- c. *stupide* [stɥpɥd]
- d. *choucroute* [ʃɔ.kɔʁt]

► (In a non-final syllable closed by a consonant other than a voiced fricative, high vowels optionally lax anyway, as in (7).)

► Voiced fricative codas block (or undo) harmonic laxing, as in (11); cf. (10b).

(11) No harmonic laxing before tautosyllabic /v z ʒ ʁ/ (Poliquin 2006: 177)

- hirsute* [ɥʁ.sɥt]

► In words with multiple possible targets for harmony, Poliquin (2006) reports an interesting range of attested patterns. Harmony may:

- ▷ target only the penultimate syllable (closest to the trigger);
- ▷ target only the initial syllable;
- ▷ target the penult and spread leftward to adjacent syllables; or
- ▷ target the initial syllable and spread rightward to adjacent syllables

► There are thus three patterns of harmony observable in trisyllabic words like the ones in Figure 2, plus the possibility of no harmony.

	NO HARMONY	PENULT ONLY	INITIAL ONLY	ITERATIVE
<i>juridique</i>	[ʒy.bi.dʒik]	[ʒy.bi.dʒik]	[ʒy.bi.dʒik]	[ʒy.bi.dʒik]
<i>limousine</i>	[li.mu.zin]	[li.mʊ.zin]	[li.mu.zin]	[li.mʊ.zin]
<i>illumine</i>	[i.ly.min]	[i.ly.min]	[i.ly.min]	[i.ly.min]
<i>dissimule</i>	[dzi.si.myl]	[dzi.si.myl]	[dzi.si.myl]	[dzi.si.myl]

Figure 2: Words with three high vowels (Poliquin 2006: 58–59)

- ▶ Among speakers with iterative harmony, the difference between penult–left and initial–right propagation can be seen in words like *illégitime*, where a non-high vowel blocks spreading.

- (12) Interaction of harmony parameters (Poliquin 2006)

	NON-ITERATIVE	ITERATIVE
PENULT	[ʒy.bi.dʒik]	[ʒy.bi.dʒik]
	[i.le.ʒi.tsim]	[i.le.ʒi.tsim]
INITIAL	[ʒy.bi.dʒik]	[ʒy.bi.dʒik]
	[i.le.ʒi.tsim]	[i.le.ʒi.tsim]

3.3 Dissimilatory laxing

- ▶ In addition to harmony, Poliquin (2006: 97) describes optional dissimilatory laxing in disyllabic words with two underlyingly identical high vowels in open syllables.

- (13) Dissimilatory laxing (Poliquin 2006: 97)
- midi* [mi.dzi] ~ [mi.dzi]
 - fini* [fi.ni] ~ [fi.ni]
 - chimie* [ʃi.mi] ~ [ʃi.mi]
 - Zoulou* [zʊ.lu] ~ [zu.lu]

- (14) No dissimilation of non-identical vowels (Poliquin 2006: 131)

- Julie* [ʒy.li]
- hibou* [i.bu]
- ciguë* [si.gy]
- poulie* [pu.li]

3.4 Tensing

- ▶ Poliquin (2006) argues that tautosyllabic voiced fricatives must actively trigger tensing of high vowels, rather than merely inhibiting or failing to trigger laxing.
- ▶ A high vowel in a non-final open syllable is (for some speakers) realized as lax before a high vowel in a final syllable closed by a voiced fricative.

- (15) Opaque interaction of harmony and tensing (Poliquin 2006: 107–108)

- piquête* [pi.ky:ʁ]
- russise* [ʁy.si:z]
- humour* [y.mu:ʁ]
- poussive* [pʊ.si:v]

- ▶ (15) can't result from dissimilation, because the vowels are not underlyingly identical.

- ▶ Poliquin (2006) analyzes (15) as resulting from an opaque rule ordering: final-syllable laxing feeds harmony, but is then undone by tensing.

- (16) Derivation of *russise*

(based on Poliquin 2006: 109)

U.R.	/ʁysiz/
Syllabification	ʁy.siz
Closed-Syllable Laxing	ʁy.siz
Harmony	ʁy.siz
Tensing	ʁy.siz
Lengthening	ʁy.si:z
S.F.	[ʁy.si:z]

4. The system of contrasts

- ▶ Laxness on Laurentian French high vowels is clearly phonologically active.
- ▶ Attempting to analyze closed-syllable laxing as spreading a contrastive feature from the coda consonant to the vowel (and potentially thence to other high vowels) won't work: we'd still need to deal with dissimilation.
- ▶ The Activity Principle predicts that if [±tense] on high vowels is active, it must be contrastive.

4.1 A contrast within the high vowels?

- ▶ The simplest way to argue for contrastive [±tense] would be to find evidence of an underlying contrast between tense /i y u/ and lax /ɪ ʏ ʊ/.
- ▶ Loanwords can have tense high vowels in final closed syllables (Walker 1984: 59).

- (17) Tense high vowels in English loanwords (Walker 1984: 59)

	LOANWORD		NATIVE ANALOGUE	
a.	<i>mean</i>	[min]	<i>mine</i>	[min]
b.	<i>boom</i>	[bʊm]	<i>boum</i>	[bʊm]
c.	<i>jeans</i>	[dʒin]	<i>fine</i>	[fin]
d.	<i>suit</i>	[sut]	<i>route</i>	[ʁʊt]

- ▶ But Walker further notes that many such words either fluctuate between tense and lax or are consistently realized with lax vowels.
- ▶ It seems more plausible that the loanwords in (17) are either not treated as French words at all, or are marked as exceptions to laxing.

4.2 A contrast with wider scope

- ▶ But /i y u/ need not contrast with /ɪ ʏ ʊ/ in order to be specified for [±tense]—if the feature takes wide enough scope, they need only contrast with *some* lax vowel(s).
- ▶ A tense–lax contrast exists in the mid vowels, though it is neutralized in some contexts and has a low functional load (Walker 1984: §2.1.3; Poliquin 2006: 4).
- ▶ Front unrounded /e/–/ɛ/ contrast in word-final open syllables, and the rounded pairs /ø/–/œ/ and /o/–/ɔ/ contrast in final closed syllables.

- (18) Tense–lax contrasts in the mid vowels (Walker 1984: 23)

a.	<i>fée</i>	[fɛ]	<i>fait</i>	[fɛ]
b.	<i>jeûne</i>	[ʒœn]	<i>seul</i>	[sœl]
c.	<i>rôle</i>	[ʁɔl]	<i>colle</i>	[kɔl]

- ▶ Elsewhere, the distribution of tense and lax mid vowels is largely governed by the “*loi de position*,” such that lax vowels occur mostly in closed syllables and tense vowels mostly in open ones (see also Lamontagne 2014).
- ▶ Burstynsky (1968) ignores this contrast. Laurentian French, in his analysis, differs from European French in that its *loi de position* applies to high vowels as well as mid ones.
- ▶ But Jakobson & Lotz (1949) treat the tense–lax distinction as pervasive in the phonology of Standard French.

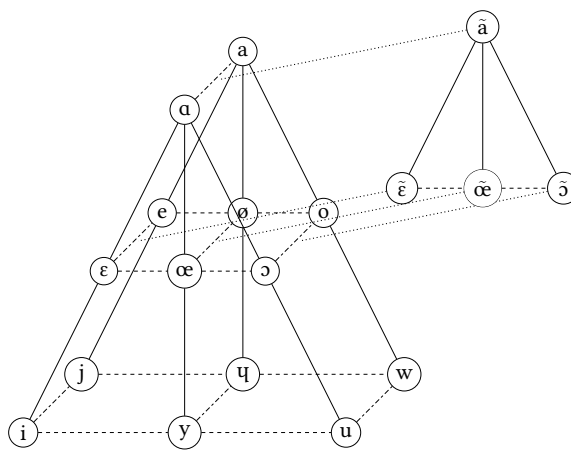


Figure 3: Oppositions in the French vowel system, adapted from Jakobson & Lotz (1949: 157)

- ▶ They identify the contrast between /ɛ œ ɔ/ and /e ø o/ with the opposition between voiceless and voiced consonants, and with the contrast between high vowels and glides and the contrast between /ɑ/ and /a/.

- ▶ Jakobson & Lotz (1949) do not give any phonological rationale for characterizing the opposition between the low vowels /ɑ/ and /a/ as a tense–lax contrast rather than a backness (or grave–acute) contrast analogous to the opposition between /o/ and /ø/.
- ▶ One possible motivation can be found in the fact that the /ɑ/–/a/ contrast, though more robust in Laurentian French than in European French, is subject to neutralization similar to the *loi de position* (Walker 1984: §3.6).
- ▶ /ɑ/ and /a/ contrast in closed or non-final syllables, neutralizing to [ɑ] in final open syllables.

- (19) Neutralization of the /ɑ/–/a/ contrast in open final syllables (Walker 1984: 78)

	CLOSED FINAL		OPEN FINAL	
a.	<i>basse</i>	[bas]	<i>bas</i>	[ba]
b.	<i>chatte</i>	[ʃat]	<i>chat</i>	[ʃɑ]
	OPEN NON-FINAL		OPEN FINAL	
c.	<i>entasser</i>	[ɑ̃.ta.se]	<i>tas</i>	[ta]
d.	<i>tabagie</i>	[ta.ba.ʒi]	<i>tabac</i>	[ta.ba]

- ▶ If the /ɑ/–/a/ contrast is marked by [±tense], then the alternations in (19), the *loi de position*, and high vowel laxing are all broadly similar if not fully unifiable.

4.3 Proposed hierarchy

- ▶ Given that [±tense] is contrastive among the oral vowels, it will be contrastively specified on /i y u/ if it is given scope over [±high]. I propose the hierarchy in Figure 4.

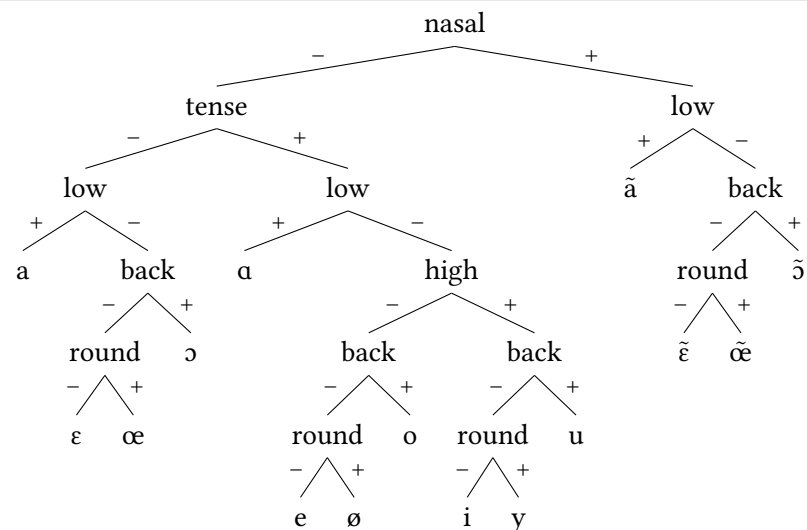


Figure 4: Proposed contrastive feature hierarchy for Laurentian French vowels

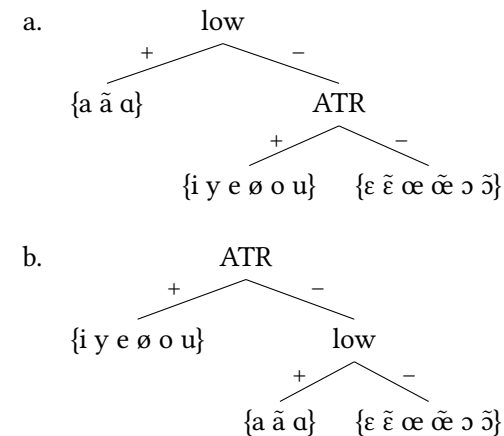
- ▶ Specification of [+tense] on the high vowels means that the patterns in §3 can be generated without making redundant features active:
 - ▷ Closed-syllable laxing changes [+high] vowels from [+tense] to [-tense].
 - ▷ Dissimilation changes a [+high] vowel from [+tense] to [-tense] if it is followed by an identical vowel in the next syllable.
 - ▷ Laxing harmony copies [-tense] from one [+high] vowel to another.
 - ▷ Making a [+high] vowel [-tense] does not cause it to become featurally identical to any of the [-tense] vowels in the underlying inventory, none of which are [+high].

5. Coalescence and feature valency

- ▶ St-Amand's (2012) account of coalescence also posits wide scope for the tense–lax contrast.
- ▶ But she argues that the features involved must be privative.
- ▶ The laxing facts imply binary [±tense]:
 - ▷ If the feature were privative TENSE, closed-syllable laxing would delete it, and harmony would need to copy the absence of a feature (cf. Gauthier 2013).
 - ▷ If it were LAX, it would be underlyingly absent on high vowels, which would make it hard to motivate dissimilatory laxing (§3.3) as an OCP effect (and would require harmony to spread an inserted feature).

- ▶ Can St-Amand's analysis of coalescence be made to work with binary features?
- ▶ Her argument for privative features hinges on the coalescence of /a/ and /e/ to [ɛ].
- ▶ The generalization to be maintained is that coalescence produces a vowel whose features are a subset of the union of the features of the two input vowels.
- ▶ Under St-Amand's assumption that the low vowels are differentiated by [±back], either ordering of binary [±ATR] and [±low] assigns /ɛ/ some feature that is not found on either /a/ or /e/.

(20) Ordering binary [±low] and [±ATR]
(St-Amand 2012: 69)



- ▶ In (20a), /a/ is unspecified for [±ATR], so there is no source for [-ATR] on [ɛ].
- ▶ In (20b), /e/ is unspecified for [±low], so there is no source for [-low] on [ɛ].

- ▶ The hierarchy in Fig. 4 avoids this problem by following Jakobson & Lotz (1949) in treating the contrast between /ɑ/ and /a/ as a tense–lax contrast rather than a place contrast.

- ▶ This makes it possible to say that coalescence of /a/ and /e/ produces [ɛ] through deletion of conflicting feature specifications and retention of non-conflicting ones.

(21) Coalescence of /a/ and /e/ with specifications as in Fig. 4

/a/	+	/e/	→	[ɛ]
-nasal		-nasal		-nasal
-tense		+tense		-tense
+low		-low		-low
		-high		(-high)
		-back		-back
		-round		-round

- ▶ St-Amand’s (2012) coalescence data also seem to be consistent with the idea that [±back] is not specified on /a/ and /ɑ/.

(22) Coalescence involving low vowels (St-Amand 2012: 66)

	V1	V2	OUTPUT
a.	/i/	/a/	[ɛ]
b.	/y/	/a/	[œ]
c.	/e/	/a/	[ɛ]
d.	/a/	/e/	[ɛ]
e.	/a/	/o/	[ɔ]
f.	/ã/	/e/	[ɛ̃]
g.	/ɑ/	/y/	[ø] ~ [œ]
h.	/õ/	/a/	[ã]

- ▶ In (22), the place of the output vowel consistently depends on that of the non-low input vowel (except in (22h), where the output is a low nasal vowel, arguably placeless).

6. Conclusions

- ▶ The contrastive hierarchy in Fig. 4 makes it possible to say that [±tense] is phonologically active on high vowels without abandoning the Activity Principle: Poliquin’s (2006) account of harmony does not require a non-contrastive feature to be phonologically active.

- ▶ The hierarchy is also consistent with attested patterns of assibilation (Burstynsky 1968) and coalescence (St-Amand 2012).

- ▶ Incorporating Jakobson & Lotz’s (1949) proposal that the /ɑ/–/a/ opposition is a tense–lax contrast removes St-Amand’s (2012) objection to binary features.

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