Loi de position : Où est la syllable?[1]

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I. INTRODUCTION

(1) Distribution des voyelles tendues et relâchées en français laurentien et standard.

Tendues	e	ø	o		i	y	u
	ɛ	œ	ɔ		ɪ	ʏ	ʊ

(2) Français laurentien (FL) *vs* français québécois *vs* français canadien

(3) Loi de position : Les voyelles tendues sont favorisées en syllabe ouverte, les voyelles relâchées en syllabe fermée.

(4) La loi de position en syllabe finale :

V moyennes	syllabe ouverte :	e ~ ɛ	ø		o
	syllabe fermée :	ɛ	ø ~ œ		o ~ ɔ

V hautes (FL)	syllabe ouverte :	i	y	u	
	syllabe fermée :	ɪ	ʏ	ʊ	(sauf r v z ʒ)

(5) La loi de position en syllabe non finale : beaucoup de variation.

(6) Côté (2008b; PFC Nouvelle-Orléans) : Présentation de données en syllabe non finale
Esquisse d'analyse

(7) Ici : Résumé des données   Analyse plus détaillée

(8) Le rôle de la structure syllabique dans l'analyse des processus phonologiques a été remis en question dans la dernière décennie (voir aussi Blevins 2003) :
Neutralisation des traits laryngés (Steriade 1999b)
Palatalisation (Kochetov 1999)
Résolution des groupes consonantiques (+ schwa français) (Côté 2000, 2008a)
Allomorphie de l'article défini (*il~lo*) en italien (McCrary 2004)
Durée segmentale (McCrary 2004)
Attraction de l'accent tonique (Ahn 2000)
Morphologie prosodique (réduplication, infixation) (Samuels 2008)
"Speech errors" (Shattuck-Hufnagel 2008)

(9) Plan

a. Distribution des V hautes et [e ɛ] non finales → hiérarchie contextuelle
b. Etudes de syllabation → même hiérarchie contextuelle
c. Faiblesse de l'analyse syllabique de la distribution des voyelles : pas de corrélation pour les voyelles moyennes entre la qualité de la voyelle et les jugements de syllabation.
d. Exploration d'une analyse asyllabique basée sur la notion de cohesion intersegmentale. L'analyse rend compte à la fois des effets syllabiques apparents dans la distribution des voyelles et des jugements de syllabation.

II. DISTRIBUTION DES VOYELLES HAUTES ET [e ɛ] NON FINALES : RESUME

(10) V en français laurentien :   enquête
V moyennes en français standard :   Tranel (1987), Laeufer (1991)
+ Hansen (2008), Goslin (2002)

(11) **The distribution of [e ɛ] (in Laurentian and general French) and that of high vowels (in LF) are subject to the same consonantal hierarchy. What varies is the points in the hierarchy at which vowel quality switches in tenseness.**

	C=consonant	L=liquid	F=fricative	O=occlusive

	_/r/C	_/l/C	_OC	_FC	_CL	_CV
ex. avec [i-ɪ]	*Firmin*	*Gilbert*	*Victor*	*Tristan*	*Hitler*	*Simon*
	+Lax					+Tense
LF high	←----------------------i~ɪ----------------------→				←---------i--------→	
LF e-ɛ	←----------------------ɛ----------------------→				←--------e~ɛ--------→	
Tranel 1987	←---ɛ---→ ←----------------e~ɛ----------------→				←----------e----------→	
Laeufer 1991	←----------ɛ---------→ ←----------e~ɛ---------→					

III. CATEGORIES DE CONSONNES ET SYLLABIFICATION : RESUME

(12) Same consonantal hierarchy in syllabification

a. Numerous psycholinguistic studies reveal a tendency for postvocalic consonants to syllabify in coda according to the following hierarchy (e.g. Fallows 1981 ; Barry et al. 1999 ; Zamuner & Ohala 1999 ; Content et al. 2001 ; Goslin 2002 ; Ishikawa 2002)

[l] > nasals > stops > fricatives

N.B. Notice the same order between stops and fricatives as in the distribution of high vowels in LF.

b. This hierarchy is observed in pre-C (VC_1C_2V) and pre-V (VC_1V) contexts :

VC_1V	→	$V.C_1V$	~	$VC_1.C_1V$ / $VC_1.V$
		Onset		Ambisyllabic / Coda
VC_1C_2V	→	$V.C_1C_2V$	~	$VC_1.C_2V$
		Complex onset		Coda-onset

=> more ambisyllabic/coda and coda-onset responses if C_1 is high in the hierarchy

(13)   A similar contextual hierarchy appears to be active in syllabification

	_/l/C	_NC	_OC	_FC	_CL	_CV
ex. with [i-ɪ]	*Gilbert*	*Linda*	*Victor*	*Tristan*	*Hitler*	*Simon*
post-vocalic C	+coda					+onset

(14) **The more the vowel attracts the following consonant in its coda, the more it is susceptible to laxing.**

IV. RELATION ENTRE QUALITE DE LA VOYELLE ET SYLLABATION

(15)   What has and has not been established

a.   Vowel quality is related to the contextual hierarchy (1)
b.   Syllabification judgments are related to the contextual hierarchy (2)
c.   The syllable-based analysis of the distribution of lax and closed vowels makes the additional hypothesis that vowel quality and syllabification are related, which has not been established (3).

3 ?
Vowel quality ⟵┈┈┈┈┈⟶ Syllabification
          1   2
Contextual hierarchy
/r/C > /l/C > NC > stopsC > fricativesC > CL > C
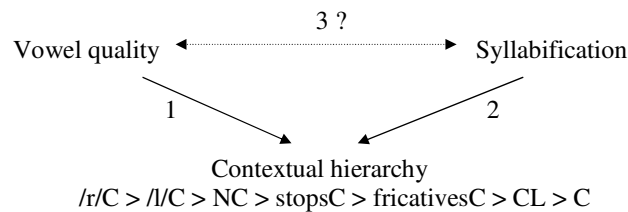
(16)   Problem with the relation in 3 : the syllabification judgments provided by LF speakers are not those expected.

(17)   High vowels

a.   Correlation between syllabification judgments and vowel quality : lax vowels are put in closed syllables and tense vowels in open syllables. These judgments give rise to very marked onsets, e.g. [lv], [rn], etc.

Sylvain   [si.lvẽ] [sɪl.vẽ]
toundra   [tu.ndrɔ] [tʊn.drɔ]

b.   This is a perfect expression of the « loi de position » (for high, not mid, vowels).

(18)   Mid vowels

a.   No correlation between vowel quality and syllabification :

• ɛ+sonorant+C   → closed syllable   e.g. *quelconque* [kɛl.kɔ̃k]
• ɛ+obstruent+C   → closed or open syllable   e.g. *veston* [vɛs.tɔ̃] ~ [vɛ.stɔ̃]
• ɛ~e + C + V   → open syllable   e.g. *aimant* [ɛ.mã] ~ [e.mã]

a.   Syllabification judgments do not support the « loi de position »

b.   Goslin 2002 : Swiss speakers (Genève) had to repeat the first syllable of VC(C)V stimuli with mid tense and lax initial vowels. Tendency to repeat only V more often when the vowel is tense, and to repeat VC more often when the vowel is lax. But this includes the mid rounded vowels, whose lax counterparts do not normally appear word-finally (in Standard French). Repeating only V with a lax vowel could be avoided simply because these vowels do not normally appear in final position. (No separate results for e vs. ɛ).

(19)   Two options

a.   Dismiss the judgments as not indicative of the more abstract notion of syllable structure that is relevant here.
        (Speakers have "good" judgements for high vowels but not mid ones.)

b.   Abandon direct relationship between syllable structure and vowel quality. Vowel distribution and syllabification are subject to the same contextual hierarchy because they are sensitive to the same (phonetic) constraint that underlies this hierarchy. But both processes are also influenced by additional factors, which ultimately explain the discrepencies between syllabification judgments and vowel quality in (18).

=> Intersegmental cohesion

V. COHÉSION INTERSEGMENTALE

(20) Each segment is linked to its adjacent (and, to a lesser extent, non-adjacent) segments

    a.   Articulatorily (coarticulation)
    b.   Perceptually (contextual cues)
    c.   Lexically (whether or not adjacent segments belong to the same morpheme/word)

(21) The force of these links is variable, depending on the nature and position of the segments involved. It is also relative.

=> Intersegmental cohesion (term taken from Bertinetto's work, e.g. Bertinetto et al. 1992, 2007)

(22) <u>Some relevant gneralizations</u> (a more coherent definition of intersegmental cohesion needs to be worked out)

    a. Consonants are more attracted to the following segment than the preceding one.
      • Asymmetry in the response of the auditory system: the onset of an acoustic signal (e.g. frication noise, formant structure) is perceptually more salient than its offset (Bladon 1986 ; Delgutte 1997 ; Wright 2004).

      • This perceptual onset boost is more pronounced if the following segment is maximally sonorous and dissimilar (Wright 2004).
      → Obstruent+vowel sequences are optimal
      → Sonorants are less attracted to a following vowel than obstruents (and more free to associate with the preceding segment)

    b. Consonants more attracted to more sonorous segments than less sonorous ones
      • More sonorous segments provide better transitional cues.

    c. More intersegmental cohesion between more similar segments than between less similar ones.

      •Similar segments display more coarticulation

    d. Stops are attracted to adjacent segments more than fricatives are.

      • Stops have week internal cues which make them more dependent upon contextual cues (including transitions from the preceding vowel). Fricatives have strong internal cues and depend less on contextual cues.

(23) Contextual hierarchy

	V/r/C	V/l/C	VOC	VFC	VCL	VCV
ex. with [i-ɪ]	*Firmin*	*Gilbert*	*Victor*	*Tristan*	*Hitler*	*Simon*
Cohesion between V and following C	+					–

  (22a) ←-------C not followed by----------------------→ ←-C followed by-→
        sonorous segment   sonorous segment

  (22c) ←C similar to V→ ←----C less similar to V--→

  (22d) ←stops more→ ←fric less→
        perceptually dependent

VI. RETOUR SUR LA QUALITE DE LA VOYELLE

(24) <u>Vowel quality and intersegmental cohesion</u>

    a. Vowel quality is determined by the degree of intersegmental cohesion with the following consonant. The higher the degree, the more laxing.

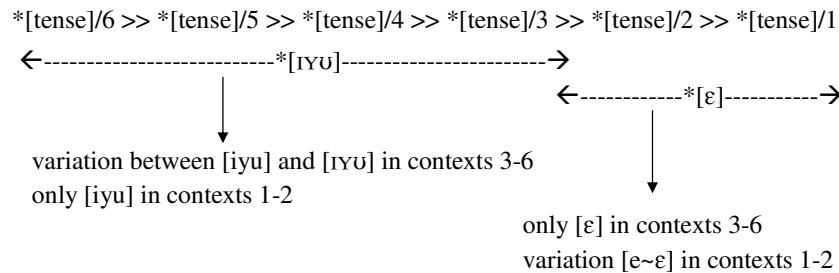|	VrCV	>	VlCV	>	VPCV	>	VFCV	>	VCLV	>	VCV
	Firmin		*Gilbert*		*Victor*		*Tristan*		*Hitler*		*Simon*
Degree	6		5		4		3		2		1

      • The « loi de position » does not rely on syllable structure but on the degree of intersegmental cohesion between the vowel and the following segment. Intersegmental cohesion interacts with other factors, notably a preference for specific segments (tense high vowels, [ɛ] in LF vs [e] in other varieties). It is supposed that the degree of intersegmental cohesion is stable (unlike syllabification judgments, which are often variable).

(25) <u>Contraints and ranking</u>

    a. *[ɪYʊ]   No [ɪYʊ]
    b. *[ɛ]   No [ɛ]

c. <u>Hierarchy</u>

*[tense]/coh=6	No tense vowel with a degree of intersegmental cohesion of 6 with the following segment
*[tense]/coh=5	No tense vowel with a degree of intersegmental cohesion of 5 with the following segment
*[tense]/coh=4	No tense vowel with a degree of intersegmental cohesion of 4 with the following segment
*[tense]/coh=3	No tense vowel with a degree of intersegmental cohesion of 3 with the following segment
*[tense]/coh=2	No tense vowel with a degree of intersegmental cohesion of 2 with the following segment
*[tense]/coh=1	No tense vowel with a degree of intersegmental cohesion of 1 with the following segment

*[tense]/6 >> *[tense]/5 >> *[tense]/4 >> *[tense]/3 >> *[tense]/2 >> *[tense]/1

←--------------------------*[ɪʏʊ]----------------------→

                   ←-----------*[ɛ]----------→

variation between [iyu] and [ɪʏʊ] in contexts 3-6
only [iyu] in contexts 1-2

            only [ɛ] in contexts 3-6
            variation [e~ɛ] in contexts 1-2

One ranking : [ɪʏʊ] before liquids+C, [iyu] elsewhere
[ɛ] before all clusters except CL, [e] before CL and single C

/fɪrmẽ/	*[ten]/6	*[ten]/5	*[ɪʏʊ]	*[ten]/4	*[ten]/3	*[ɛ]	*[ten]/2	*[ten]/1
firmẽ	* !							
→ fɪrmẽ			*					
/vɪktɔr/								
→ viktɔr				*				
vɪktɔr			* !					
/vɛktœr/								
vektœr				* !				
→ vɛktœr						*		
/Emã/								
→ emã							*	
ɛmã						* !		

One ranking : [ɪʏʊ ɛ] before all clusters, [iyu e] before single consonants

/Itlɛr/	*[ten]/6	*[ten]/5	*[ten]/4	*[ten]/3	*[ten]/2	*[ɪʏʊ]	*[ɛ]	*[ten]/1
itlɛr					* !			
→ ɪtlɛr							*	
/sImɔ̃/								
→ simɔ̃								*
sɪmɔ̃							* !	
/Ekrã/								
ekrã					* !			
→ ɛkrã							*	
/Emã/								
→ emã							*	
ɛmã						* !		

VII. Retour sur la syllabation

(26) a. Syllabification does not intervene in determining vowel quality.

    b. Syllabification is a paralinguistic process which consists in dividing sequences into disjoint "syllable-size" constituents. It is influenced by intersegmental cohesion : more cohesive segments tend to be syllabified together, and syllable boundaries tend to be put where intersegmental cohesion is weakest.

    c. Hence the apparent relationship between vowel quality and syllabification : intersegmental cohesion determines vowel quality and also, in part, syllabification judgments.

    d. Syllabification judgments are subject to additional factors, notably correspondence between syllable and word margins (Steriade 1999a) : tendency to put in syllable-initial or final position segments that are attested word-initially or finally. This explains the difference between high and mid vowels in LF.

      • <u>High</u> : Word-finally, complementary distribution between tense vowels in final position and lax vowels preconsonantally. This distribution is reproduced in the syllabification of internal high vowels :

      [sɪl.vẽ] *[sɪ.lvẽ]   [si.lvẽ] *[sil.vẽ]

      • Similar experimental results with English lax vowels (Treiman & Danis 1988) or Dutch short vowels other than schwa (Schiller et al. 1997), which do not appear word-finally : consonants preceded by these vowels tend to syllabify in the coda of the preceding syllable, whereas consonants preceded by other vowels avoid the coda position.

- Mid: [e] and [ɛ] are both freely available word-finally. Only [ɛ] appears preconsonantally in final syllables.

- Internal [ɛ] can be syllabified in closed or open syllables [vɛs.tɔ̃]~[vɛ.stɔ̃]

- [ɛ.mɑ̃] ~ [e.mɑ̃] (intersegmental cohesion between [m] and the preceding vowel may be too weak to allow [em.ɑ̃] ; [em.ɑ̃] expected to be excluded because [e] doesn't appear preconsonantally at word boundaries)

→ It is vowel quality that determines syllabification, not the reverse.

VIII. LE MYSTÈRE DU MIDI

(27) a. Les voyelles moyennes en français du midi obéissent de façon plus stricte à la loi de position, sauf quand la syllabe suivante contient un schwa :
      bêtement   [bɛt@mɑ̃]
      bêtise   [betiz]

     b. Solution possible: La cohesion intersegmentale entre une consonne et la voyelle suivante est plus faible si cette voyelle est un schwa. Une consonne suivie d'un schwa est donc plus fortement attirée par la voyelle précédente. Le niveau de cohésion intersegmentale entre la voyelle et le [t] de *bête* est donc plus élevé dans *bêtement* que dans *bêtise*, ce qui favorise le relâchement.

IX. CONCLUSION

The quality of French high and mid vowels is determined by the nature of the following consonants. The contexts that favor vowel laxing in French are also those that favor closed syllabes in syllabification studies. The relationship between vowel quality and syllable structure is, however, only indirect, as we do not always get the expected correlation between vowel quality and syllabification judgments in French. It is suggested that both processes depend on the "deeper" notion of intersegmental cohesion, which is determined in large part by articulatory and/or perceptual factors.

Intersegmental cohesion can directly account for the distribution of lax and tense vowels : the higher the degree of cohesion between a vowel and the following segment, the more likely the vowel surfaces as lax. Syllabification judgments are also influenced by intersegmental cohesion, but additional factors such as the tendency for syllables to respect word edge phonotactics (each syllable should look if possible like a possible word) may result in mismatches between vowel quality and syllable structure. In fact, it is vowel quality that participates in syllabification judgments, not syllable structure that determines vowel quality.

To what extent can/should apparent syllabic effects in various phonological processes be reformulated in terms of intersegmental cohesion or, more generally, on other factors possibly underlying syllables?

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