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On explaining Cross-syllabic Constraints

Yves Charles Morin

1. Introduction

In this paper I examine /r/ reduction[1] in the Occitan dialect of Vinzelles (Dauzat 1897, 1900) — a phenomenon which implies a change in our conception of syllable structure and syllabification if we accept the hypothesis that rules affecting syllabic structures are primarily determined by syllabic conditions — and suggest a form of syllabic spreading which accounts for the cross-syllabic constraints involved in it (Morin, 1982). Spreading should be distinguished from resyllabification as argued for instance by Selkirk (1982: 337–383), as it creates new syllable types which are not basic, or by Singh (1980) and Piggott and Singh (1984), as it is not part of a strategy to repair initial syllabifications which violate language specific syllabic constraints.

2. The syllabic structure of Vinzelles Occitan: a case study

The syllabic structure of Vinzelles Occ. is relatively simple.[2] Most syllables are open, e.g. [ʁɔ] 'hot (masc.)' or [ˈʁɔdɐ] 'hot (fem.)'. They may be closed by

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1 Loss of /r/ codas before O+L clusters can be found not only all over the Gallo-Romance domain (cf. Ronjat, 1932: 230 for Occitan; Gonon (1947: 233) and Veÿ (1911) for Francoprovençal; Vautherin (1896) for North-Eastern French), but also in many other Indo-European and Semitic languages (cf. Grammont 1933: 293–294). It is not always regular, and is sometimes compounded to other coda simplifications.

2 The language has a rich vowel system with four degrees of opening, and four places of articulation. Length is distinctive for all vowels, except for the non-low central ones which are short: non-high long vowels, however, can only be

a liquid /r/, e.g. [var] ‘green (masc.)’ or [ˈvardɐ] ‘green (fem.)’, or /l/, e.g. [rjylˈta] (place name). In some cases, /s/ may be found before consonants within words, as in [ˈdzustə] ‘just (masc.)’ where it could be either a coda or an onset. This /s/ will be ignored here, because of its distribution is marginal and because its proper status is not crucial to the analysis.

Syllable onsets are also relatively simple. They may be any one consonant, a sequence O+L, or a sequence Consonant+Glide (C+G), with some restrictions on these combinations. In particular, in O+L clusters, the obstruents can be /p, b, t, d, k, g, f, v/ before /r/, /p, b, g, f/ before /l/ and /k/ before /ʎ/. Similar restrictions can be found on the permissible C+G clusters; the proper analysis of glides is not relevant here and will be ignored in the discussion.

In summary, one can say that the basic syllable structure in Vinzelles Occ. is (C)(S)V(L), where C can be any consonant, S a liquid or a glide, V a vowel, and

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unstressed. Nasalization is distinctive, but is limited to three vowels; nasalized vowels are short (Dauzat 1897: 57):

ɪ iː	ʏ yː	ɨ ʉ	ʊ uː
e eː ẽ	ø ø̃	ə	o oː õ
ɛ ɛ̃		ɐ	ɔ ɔ̃
		a aː ã	

The consonant system is as follows:

voiceless stops	p	t	c	k
voiced stops	b	d	ɟ	g
voiceless affricates		ʦ	ʧ	
voiced affricates		ʣ	ʤ	
voiceless fricatives	f	s	ʃ	
voiced fricatives	v	z ð	ʒ	
nasals	m	n	ɲ	
liquids and glides		l r	ʎ j	w ɥ

All words belonging to major categories receive a stress on either the final or the penultimate syllable (for a recent re-analysis, cf. Morin 2000)

L a liquid, and where the sequences C+S in the onset are subject to specific collocational constraints (in particular those we just mentioned on O+L sequences). It is irrelevant to the discussion whether or not one should allow for internal hierarchical structure within syllables (cf. Vennemann 1984 [1988]). All that is required here of a syllabic theory is that it allows for the definition in each language of what Millardet (1923: 301 et seq.) calls its syllabic norm, i.e. the sequences of segments which may constitute a syllable. In particular the syllabic norm of Vinzelles Occ. specifies that /tr/ is a permissible syllable onset, but not */trw/, or that /r/ is a permissible coda, but not */rt/, although these may belong to the syllabic norm of other languages and thus are not simply excluded on universal grounds.

3. Deletion of /r/ codas in Vinzelles Occitan

The historical process of /r/ reduction before O+L clusters is completely regular in Vinzelles. Below are some examples (where M.A. precedes forms attested in Middle Ages texts from that area):

(1) a. M.A. arbre > ˈabrə ‘tree’
b. M.A. dimercre > ɟiˈmɛkrə ‘Wednesday’
c. M.A. perdris > pɐˈdrɛi̯ ‘partridge’

These examples show that /r/ reduction occurs both before an unstressed syllable as in (1a) or (1b) or before a stressed one as in (1c). Even in verbal paradigms, the historical alternation — which is often leveled in many dialects — has been preserved, as in the following representative examples of the verb [ˈmodrə] ‘to bite’:

(2) a. ˈmordə ‘I bite’
b. ˈmurɟɐ ‘he bit’
c. ˈmodrə ‘to bite’
d. muˈdre ‘I will bite’

The verb [ˈmodrə] had two stems /mord-/ and /murd-/, whose distribution is no longer determined by stress. When the stem is followed by a vowel or a yod, its /r/ remains, as in (2a) /ˈmord+ə/ > [ˈmordə] or in (2b) /ˈmurd+jɐ/ > [ˈmurɟɐ].

When it is followed by a /r/, however, the /r/ in the stem is elided, as in (2c) /ˈmord+rə/ > [ˈmodrə] or in (2d) /murd+ˈre/ > [muˈdre].

Loss of syllable-final /r/ would have a simple syllabic interpretation if it applied to all codas (also a frequent development in Gallo-Romance). It would then be construed as a change of syllabic norm from (C)(S)V(L) to (C)(S)V. But this is not the case here.

Vinzelles's evolution may also be compared to that of Liège Walloon. At one time, word-final schwa deletion created new codas in this dialect, whose norm then became (C)(S)V(L)(C) (ignoring some later developments in the onset), e.g. M.A. *verte* > *[vɛrt] 'green'. Eventually, /r/'s were eliminated before a consonant in the same coda, i.e. the norm became (C)(S)V(C), which led, e.g., to the following alternations:

(3) Liège Walloon:

a. M.A. verdeur > [vɛrdøːr] 'greenness'

b. M.A. vert > [vɛr] 'green (masc.)'

c. M.A. verte > *[vɛrt] > [vɛt] 'green (fem.)'

In these two cases, the deletion of /r/ could be related to a change in the basic syllabic configuration. What happened in Vinzelles, however, is different. The configuration was (C)(S)V(L) both before and after /r/ disappeared: M.A. *mordre* was syllabified [ˈmɔr]-[drə], and this still conforms to the modern syllabic norm.

A syllabic interpretation of /r/ reduction in Vinzelles would then require that — contrary to what I said — O+L sequences do not always constitute syllable onsets. If we assume that word-internal O before L belongs to the previous syllable, e.g. that [ˈsubrə] 'on' and [suˈbra] 'to be abundant' are syllabified as: [ˈsub]-[rə] and [sub]-[ˈra], then /r/ reduction in Vinzelles Occ. is similar to that of Liège Walloon. For instance, M.A. *mordre* 'to bite' would have, at one time, been syllabified as [ˈmɔrd]-[rə] where the first /r/ was followed by another consonant in the same syllable, in contradistinction to the /r/ of M.A. *morde* 'I bite' which was then syllable final: [ˈmɔr]-[də].

This new syllabic analysis, however, appears to raise more problems than it solves. In particular, the rules defining the syllabic norm become rather complex. Two kinds of onsets must be distinguished: (i) C(S) word initially, and (ii) C(G) word internally. Although O+L sequences constitute a valid onset word initially, e.g. in the imperative [ˈtronɐ] 'turn!' they must necessarily be divided between two different syllables word internally. Similarly, two kinds of codas

are required: (i) O when and only when the next syllable begins with a liquid, and (ii) L elsewhere, as one does not find words such as *[dad] or *[ˈdad]-[bə]. This analysis requires collocational restrictions between syllables, which are not simple cases of assimilation in points or manner of articulation,[3] and which entirely duplicate the collocational restrictions posited for word-initial onsets. For instance the sequence /tl/ would be impossible both in word-initial onsets and between two consecutive syllables. These restrictions also make it appear to be an accident that word-final and word-internal codas are different only when the later are followed by a liquid.

This obviously is not a viable solution. In section 5, we will see how one can keep its merits — i.e. explain /r/ reduction as a result of a change of syllable structure — without its drawbacks. But first, we examine the traditional alternative non-syllabic explanation for /r/ reduction.

4. Assimilation, dissimilation and syllabic structure

One possible alternative to this problem is to consider that /r/ reduction in these contexts does not concern syllabic theory, and that instead, it is amenable to different phonological principles. Grammont (1933: 292–296, 295*n*1) proposes it to be part of a larger theory on dissimilation which he opposes to simple syllabic adjustment.

One may perhaps question this interpretation of /r/ reduction before O+L onsets. If we accept Ohala's analysis of dissimilatory processes (1981, 1983), they are '"hyper-correction" at the phonetic level' of assimilatory tendencies. The assimilatory counterpart of /r/+O+/r/ > O+/r/ would be O+/r/ > /r/+O+/r/ which does not appear to be very frequent. What one observes frequently, however, is the progression of /r/ into the following onset: /r/+O > /r/+O+/r/. This change is not the converse of /r/ deletion. On the contrary, it can be followed by the latter to give the impression of a metathesis; for instance in Vinzelles Occ., M.A. *perdis* > M.A. *perdris* > [pʁˈdrɛi̯]. M.A. *Marta* > M.A. *Martra* > [ˈmatrʁ] 'Martha'. Furthermore, one also finds clear cases of /r/ deletion before O+/l/ clusters in

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[3] One frequently finds collocational restrictions between syllable against two adjacent consonants with different points of articulation, e.g. Spanish *campo* or *manto*, but neither **canpo* nor **mamto*. It can be argued that these are not directly related to cross-syllabic properties, because similar restrictions can also be found within syllables, e.g. some languages allow codas such as *ant* but not **amt*. Cf. Harris (1984).

other Gallo-Romance dialects, e.g. in Le Havre Norman (Maze 1903: 32) M.A. *cercle* > [sɛːkl] ‘circle’ (elsewhere /r/ often assimilated to /l/, and then became /w/), where the term ‘dissimilation’ does not apply easily.

But even if one can describe the processes mentioned above as assimilations or dissimilations, this does not necessarily constitute an alternative explanation. They could well be both dissimilations *and* syllabic reductions. In some sense epenthesis in the change /r/+O+/r/ > /r/+O+/ər/ could also count as a dissimilation, obtained through resyllabification. Indeed, /r/ reduction itself is sensitive to syllabic parameters: it is more frequent in Gallo-Romance and Catalan before those O+L clusters which are more marked qua syllable onsets, e.g. more frequent before /br/ than before /tr/.[4]

There are further indications that O+L onsets may have a specific syllabic status which could explain why /r/ reduction preferably occurs in such contexts. In Brussels French, Grimes (1983) notes two allophonic variants for (uvular) /r/: a fricative variant [ʁ̞] and its devoiced counterpart in word-final position, and a ‘sonorant’ [ʁ]; if we ignore words of Flemish origin, [ʁ] is only found before another consonant in the same syllable as in *porte* [pɔʁt] ‘door’ *and* before O+L clusters as in *arbre* [aʁbʁ̞ə] ‘tree’, *mercredi* [mɛʁkʁ̞ədi] ‘Wednesday’, but not in *rire* [ʁ̞iʁ̞̊] or *formidable* [fɔʁ̞midablə].

A similar observation can be made in Vinzelles Occ. In one recent borrowing from French, *malgré* > [maːləˈgre] ‘in spite of’, an epenthetic vowel appears before the O+L onset.[5]

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[4] The relative markedness of /br/ onsets in Gallo-Romance is evidenced by other syllabic changes which affected then. For instance, word internal O+/r/ in Vinzelles is sometimes metathesized, e.g. M.A. [ˈʧebrə] (older form) > [ˈʧʁbə] ‘hemp’ but this affects /br/ onsets and only these (Dauzat 1897:43).

[5] There are however relatively few forms with /l/-codas, as early Romance /l/-codas have been vocalized. An epenthetic shwa is regularly added after word-final /l/ in loans from French: Fr. *bal* ‘dance’ > [ˈbalə]. Word-internal /l/-codas result from later syncope as in [rjylˈta] (place name) < °*Rouyolatas* and may be found in loans from French. Dauzat (1913–1914–1926) lists only five other relevant forms: three without epenthesis: [ʁpəsyldʁmẽ] ‘absolutely’ < *absolutamente*, [kõsylˈta] ‘to consult (a doctor)’ (from French *consulter*), [kõˈsyltʁ] ‘(medical) consultation’; one in which /l/ is replaced by /r/: [rəˈkortʁ] ‘crop’ (from French *récolte*); one with epenthesis: [koləporˈtœr] ‘peddlar’ (from French *colporteur*) — the epenthesis is probably motivated by the transparent structure of this compound word: *col* + *porteur*, with *col* adapted as [kolə].

5. Syllable spreading

A syllabic interpretation of /r/ reduction in Vinzelles Occ. faces the following problems: (i) if we adopt (C)(S)V(L) as the basic syllabic configuration, we cannot account for the loss of /r/ before O+L onsets in a simple way, and (ii) if we adopt a basic syllabic configuration in which word internal O+L sequences belong to two different syllables, we must allow for complicated and unilluminating intersyllabic collocational restrictions.

A simple solution is the combination of both syllabifications. I suggest a form of resyllabification, called here *spreading*, which applies to *basic* syllables to create *derived* ones. Spreading moves the onset or part of the onset of a basic syllable to the left onto the preceding one.

The historical changes that took place in Vinzelles Occ. may now be reinterpreted as follows. Initially the basic syllabic structure was (C)(S)V(L) and there probably was no spreading. Eventually spreading of O in O+L basic onsets was added to the language: [ˈmɔrdrə] 'to bite' not only kept its original basic syllabic structure [ˈmɔr]-[drə] but acquired the derived structure [ˈmɔrd]-[rə]. At that time there were no specific restrictions on derived syllable. What I claim, though, is that derived syllables may also be the object of specific constraints. Here, the codas of derived syllables were no longer allowed to contain more than a single consonant (parallel to what happened in Liège Walloon, for instance). This was responsible for the change from [ˈmɔrd]-[rə] to [ˈmɔd]-[rə]. Later, the basic syllable structure, the spreading rule, and the constraints on derived syllables have remained unchanged in the language. When *malgré* 'in spite of' was borrowed, the rule of /r/ reduction was no longer active or did not extend to /l/. The constraint, however, was still active and as a consequence the derived structure *[malg]-[ˈre] was not acceptable. A repair was achieved through epenthesis: [ma]-[ləg]-[ˈre].

It is important to stress that derived syllables need not conform to the basic syllabic structure. The essential motivation for spreading is the impossibility to find an adequate syllabic structure without ad hoc collocational restrictions between syllables. The two-step operation defended here amounts to a definition of syllabic structure as a series of approximations: first a rough account of the phonotactics of the language with only a minimal amount of collocational restrictions (viz. those which are amenable to other theories, as is the case of cross-syllabic constraints on points and manner of articulation), and then a refinement of the result of this first operation.

Although in this presentation, spreading was described as a displacement rule, nothing depends crucially on this interpretation. On the contrary, I think that spreading is a gradient. The actual derived syllabic structure of [ˈmɔrdrə] could be understood as [ˈmɔrd$_1$]-[d$_2$rə], where d$_1$-d$_2$ represents the obstruent /d/ spread over the syllable boundary, as is often understood under the label of 'ambisyllabicity'. With this interpretation, /r/ reduction would result from the progressive 'invasion' of d$_1$ on its territory, up to a point where there is not room left for it.

Ultimately, spreading could be viewed as a means to reduce the inherent crowdedness within some syllable onsets.

6. Conclusion

A model with two levels for syllabic representation as suggested here is rich enough to provide a simple account of why /r/ reduction occurs before an O+L sequence but not before a simple O, a common historical change that current syllabic theories find difficult to explain.

More generally, this model permits the characterization of other cross-syllabic constraints responsible for the absence of schwa syncope between an obstruent and a liquid when the obstruent is preceded by /r/, or for the development of an epenthetic vowel inside a group L+O+L in a language that allows both syllable final liquids and O+L onsets. It also offers a simple account of the gemination of obstruents in some O+L word internal onsets in languages such as Italian or Catalan and for what is often referred to as ambisyllabicity in Brussels French, as we intend to show elsewhere.

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2003 Postscript

Elordieta and Franco (1995) claim that the syllabic analysis offered in this paper is ill advised as the problem should be viewed as a simple case of dissimilation. Posner (1998:332) rightly observes that these authors would have profited from better sources of information on dissimilation.

The complete regularity of /r/ reduction in Vinzelles Occ., however, shows that it is structure governed and can only result from changes in the syllabic norm of the language. These changes, however, are not amenable to current theories of preference laws for syllable structure, as proposed by Vennemann (1988).

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