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French diachronics: what left-moving yod tells us about s+C

The development from Latin to Old French offers a window on the phonological object of wonder s+C. There is a massive literature on s+C, which deceives about all expectations phonologists have regarding clusters (Goad 2011).

Sources of left-moving yod. In the development of French there are two sources of left-moving yod: (Romance) palatalization and metathesis. In intervocalic position, the (voiceless version of the) former process is k+i,e > j+ts : placēre > plaisir, aucellu > oisel (mod. oiseau) where spelt OFr. <i> is the yod produced by palatalization, whose output is otherwise ts that later undergoes regular intervocalic voicing and appears as dz in OFr. (spelt <s>, today [z]). Note that the data presentation format here and below is X > Y (mod. Z) where X is the Latin, Y the OFr. and Z the Mod. French form. In case Y=Z only Y is indicated, and if Y has no modern representative it is glossed.

Metathesis operates Cj > jC for C=t,s,r, for example bāsiāre > baisier (mod. baiser), paria > paire, ratiōne > raison. Note that the input to tj is actually tsj, the assibilation of t,d before yod being already effected in Latin. Hence ts+j > j+ts, the ts later undergoing intervocalic voicing (dz spelt <s> in OFr.).

Ground rule. There is a constraint on syllable structure in the relevant period that suffers no exception and has multiple consequences: stated in traditional terminology, superheavy rhymes are prohibited (rhymes can dominate two x-slots at most). That is, a vowel may either be long or short. In case it is short there may be a coda, but it cannot be followed by a coda if it is long: *VVC.CV. Also, there cannot be more than one coda: *VCC.CV. An overarching effect thereof that has shaped the entire language is diphthongization: tonic vowels were lengthened, but only in open syllables (tonic lengthening occurs in many languages), and long vowels have then diphthongized. Hence e > ie in feru > fier but not in herba > herbe, i > ei > oi in pira > poire but not in virga > verge etc. The absence of diphthongization is thus due to the prior incapacity of the vowel to lengthen in a closed syllable. The reverse situation is encountered when intervocalic tr, dr lenite: they produce singleton r after tonic (°cathedra > OFr. chaiere (mod. chaire)), but geminate rr after unstressed vowels (quadrātu > OFr. carré). Here the geminate cannot be created (from a branching onset tr, dr) since there is no space for a coda in the preceding syllable in case it is tonic, i.e. has a long vowel (later diphthong).

Yod blocked. Left-moving yod shows the effect expected: it is blocked, i.e. cannot be anchored as a coda and disappears without a trace in case the preceding syllable is closed. Palatalization k+i,e > j+ts: n__ cancellāre > chanceler, l__ calce > chals (mod. chaux), r__ mercēde > merci. Metathesis t,s,r+j > j+t,s,r: n__ cantiōne > chançon (mod. chanson), __l °altiāre > haucier (mod. hausser), r__ °fortiāre > forcier (mod. forcer), factiōne > façon, captiāre > chacier (mod. chasser). Note that branching onsets allow yod to metathesize: pr__ cupriu > cuivre, br__ ēbriu > ivre, tr__ arbitriu > arvoire "illusion".

Yod goes through s+C. When s precedes k+i,e (palatalization) or t,s,r+j, left-moving yod survives. Palatalization k+i,e > j+ts: vascellu > vaissel (mod. vaisseau), pisciōne > peisson (mod. poisson) etc. Note that, independently of the fate of yod, s+k+i,e produces ss (rather than the expected sts) whose status as a geminate is guaranteed by the fact that it won't voice (until today, singleton s being subjected to voicing: causa > cho[z]e). Yod originating in palatalization also survives when the k appears as a t in OFr., which is what happens when the following i,e is syncopated: cresc(e)re > croistre (mod. croître), °nasc(e)re > naistre (mod. naître). Illustration for metathesis: angustia > angoisse, pastiōne > paisson, ōstiu > uis (mod. huis). As in the case of vascellu > vaissel, expected sts (recall that tj is assibilated to tsj, hence sts+j > j+sts) appears as the geminate ss (immune against voicing). Note that branching onsets do not block (as was shown above) even when preceded by an s: ostrea > uistre (mod. huître), post(e)riōne > poistron (mod. potron-minet).

s+C is an interlude. The tempting conclusion that s+C is not an interlude in the language, i.e. that s does not sit in a coda position, is too hasty: s+C does block diphthongization and hence with respect to this process s behaves like all other regular codas: crispāre > cresper (mod. crisper), testa > teste (mod. tête), musca > mosche (mod. mouche) etc.

The conundrum. The survival of left-moving yod is clearly determined by syllable structure: whatever the analysis, it will be based on the incapacity of yod to establish itself as a coda in case there is already a coda (effect of *VCC.CV). This also means that in case yod survives it *is* a coda. The question then is the syllabic status of the s in s+C when preceded by a coda yod: s cannot be a

coda itself. But we are sure it is a coda elsewhere because it prevents vowel lengthening (and hence diphtongization) to its left. An additional issue is the evolution sƚs (expected) > ss (unexpected) observed in both palatalization and metathesis.

Analysis I: not a contour. The obvious move to accommodate s+C when preceded by a coda yod is to make it a contour segment: in o̲strea > ui.stre the st represents one single x-slot. The representation of s+C as a contour segment is an option entertained in the literature (starting with Steriade 1982: 346ff). The contour segment analyis of s+C preceded by coda yod is refuted by the behaviour of ss+j, though. In order to see this consider that metathesis goes into effect in ss+j: °bassi̲āre > baissier (mod. baisser), messi̲ōne > moisson etc. This is unexpected since, recall, metathesis is always blocked in presence of a preceding coda, except if this coda is s. Also note that non-s geminates do block metathesis as expected: burri̲ōne > borjon (mod. bourgeon). Hence ss appears to be some kind of s+C cluster, rather than a geminate. In any case it cannot be a contour segment: two s under one x-slot would already be strange enough, but the fact that ss resists intervocalic voicing (until today: bai[s]er) disqualifies the contour segment analysis since voiceless singletons undergo voicing.

Analysis II. The puzzle falls into place if s branches on the empty nucleus to its right (Barillot & Rizzolo 2012). In this view s+C, but not f+C, χ+C etc., are special because of all obstruents only s has the ability to branch on nuclei. In Strict CV a coda consonant is one which is followed by a governed empty nucleus. Hence in vasce̲llu under (1a) the s is in coda position (government relations are not shown: the following nucleus is filled). The yod produced by palatalization moves left and seeks to establish itself in a coda position, for which extra syllabic material needs to be created: the non-etymological grey-shaded CV unit under (1b) comes into being as the result of the phonologization of the floating I, which attaches to its C position. The structure now bearing two empty nuclei in a row (i.e. two codas) is ill-formed and this is repaired by the s branching on the empty nucleus to its right.

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(1) a.  C V C V    > b.  C V C V C V C V
        |   | |             |   | |  ⟋  | |
        va  s k ellu        v a I  s  ƚs e l
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This makes the structure well-formed where yod is a regular coda and ƚs intervocalic (= flanked by two contentful nuclei). Like all other intervocalic stops of the language, ƚs therefore undergoes spirantization and this is why ƚs > s (were s in sƚs a coda, ƚs would be in strong position and could never lenite). In °bassi̲āre > baissier, events are identical: left-moving I is accommodated in a diachronically epenthetic CV unit, which creates two empty nuclei in a row (bajøsøsare) that is repaired by the left-headed geminate s branching on the empty nucleus in its midst (hence the segment s is associated to three constituents: its two original onsets plus the empty nucleus enclosed). This structure does not undergo intervocalic voicing because it is preceded by an empty nucleus and hence not intervocalic.

Triggering conditions. In the analysis discussed the branching of s is triggered by the addition of an empty nucleus to its left. Since s is already followed by an empty nucleus (on which it will branch), it thus branches to its right iff it is surrounded by empty nuclei.

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(2) a.  C V C V C V C V     b.  C V C V C V C V
        | |  ⟋  | |              ⟋      |    | |
        V I  s   C V            V       s    C V
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This is the reason of the asymmetry between the two cases discussed where extra syllabic space is inserted to the left of s+C clusters: when stress provides an extra CV unit in order for the tonic vowel to lengthen (2b), s does not branch and the structure remains ill-formed because the dependent V of the putatively long vowel is unlicensed by the following empty nucleus (which would be filled if s branched). By contrast under (2a) s branches when the extra CV unit is inserted to its left in order to host the yod. The reason why s reacts under (2a) but not under (2b) is that there an empty nucleus to its left in the former, but not in the latter case.

Independent evidence. An unrelated s-based effect in the language falls out on the preceding analysis. When a triconsonantal sequence $C_1C_2C_3$ is created, the middle consonant is consistently lost (m in dorm(i)tо̄riu > dortoir, p in comp(u)tāre > conter etc.), except when C_2 and C_3 are a good branching onset (perd(e)re > perdre). But also in case the middle consonant is s: ma̲x(i)mu > maisme "en particulier" (ksm > jsm), fra̲x(i)nu > fraisne (mod. frêne) (ksn > jsn). It is not the case, though, that s+C is somehow solidary and always saves CCC: when C_1=s, the middle consonant is lost as everywhere else: stm > sm in test(i)mо̄niu > tesmoin (mod. témoin), spt > st in ho̲sp(i)te > oste (mod. hôte) etc. Things fall in place when knowing that s branches to its right in case it is surrounded by empty nuclei: this is the case in CsC (which is rescued by the branching of s), but not in VsCC. In the latter case s is indeed preceded by a contentful nucleus and therefore does not branch, which entails the elimination of the middle C. The overall generalization regarding the fate of CCC clusters, then, is

that they survive iff the empty nucleus between C_2 and C_3 can be made inoffensive: either by circumscribing it through the establishment of a branching onset (which in Strict CV amounts to an infrasegmental realtionship between C_2 and C_3) or by identifying it through branching.