The representation of *s*C-clusters: a CV analysis
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The representation of *s*C-clusters has long been a challenge because they exhibit ambiguous behaviour: word-internally they pattern like coda-onset clusters, but in many languages they can also occur word-initially. Even here, however, they behave differently from regular branching onsets (comprising an obstruent followed by a sonorant). Therefore, [s] in this position has been analysed variously as extrasyllabic, as an appendix, as a coda, or as part of a complex segment (see Goad 2011 and references therein). In this talk, I propose a CV analysis where [s] can branch on a preceding V position, which also reveals why it is exactly [s] that can behave in such a special way.

Data. Word-internally, *s*C-clusters are heterosyllabic, as evidenced by Italian Tonic Lengthening. Vowel length is predictable by the requirement that stressed rhymes must be heavy: short stressed vowels in open rhymes lengthen (1a-b), whereas a coda already provides the required weight (1c-d), and no lengthening is found before *s*C-clusters either (1e).

(1) a. [fáːto]   'fate'   (2) a. *paltò pulito*   [paltóppulíːto]   'clean coat'
    b. [káːpra] 'goat'   b. *città santa*   [tʃittássánta]   'holy city'
    c. [párko]   'park'   c. *città triste*   [tʃittáttríste]   'sad city'
    d. [fátto]   'fact'   d. *caffè spesso*   [kaféspésso]   'thick coffee'
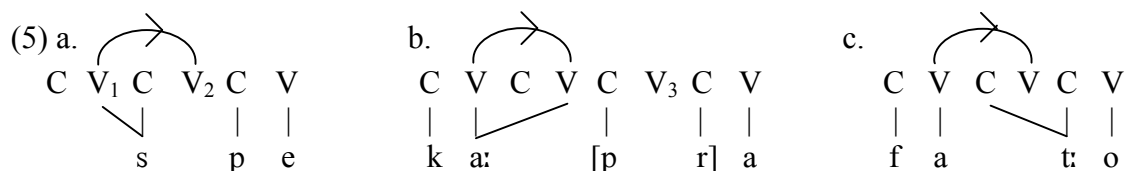   e. [pásta]   'pasta'

Unlike other coda-onset clusters, *s*C-clusters are also permitted word-initially, where again they do not pattern with onsets, as shown by *raddoppiamento sintattico* (RS) (2). The first consonant in a word-initial onset geminates if preceded by a word ending in a stressed vowel (2a-c). The initial [s] in an *s*C-cluster, in contrast, remains short (2d).

In European Portugese, nasals cannot appear in a coda, instead nasalisation of the preceding vowel occurs. When the negative prefix *in-* is added to a vowel-initial stem, the nasal surfaces intact (3a). When it is followed by a simple or branching onset, a nasal vowel arises (3b-d). Stems beginning with an *s*C-cluster behave like vowel-initial stems do and the nasal consonant is preserved (3e).

(3) a. [in]aplicável   'inapplicable'   (4) a. O R   O   b. O
    b. [ĩ]decente   'indecent'   N
    c. [ĩ]sonhável   'inconceivable'   │
    d. [ĩ]frangível   'unbreakable'
    e. [inʃk]apável   'inescapable'

$$\text{(4) a.} \quad \begin{array}{cccc} O & R & O & \quad b. \quad O \\ & | \backslash & | & \quad\quad |\backslash \\ & N & & \\ & | & & \\ x & x\ \ x & x & \quad\quad x\ \ \ x \\ | & |\ \ \ | & | & \quad\quad |\ \ \ \ | \\ s & C & & obs\ \ son \end{array}$$

Previous accounts. Kaye 1992 proposes to account for the above data by assuming that *s*C-clusters always form coda-onset sequences, which word-initially are preceded by an empty nucleus (4a) (as opposed to the structure of branching onsets (4b)). Gemination in (2) can be understood as another means of satisfying the weight requirement on stressed rhymes in Italian by providing a coda (when vowel lengthening is not available). This is not necessary in (2d) as the stressed vowel here can occupy the empty nucleus inside the closed rhyme of the initial *s*C-cluster. In Portugese, the final nasal of the prefix can only surface as a consonant when it can occupy the empty onset at the beginning of a vowel-initial stem (including *s*C-clusters as in (4a)). Before a filled onset, it surfaces as vowel nasalisation. An analysis in terms of an appendix or complex segment cannot account for the pattern in (3) because there is no extra slot for the nasal to fill in (3e). The main problem regarding this analysis is that it is not clear what licenses the empty nucleus in (4a) to remain silent, which is why Kaye calls it Magic Licensing. The choice of [s] as the special consonant is also unexplained.

Analysis. To solve these problems, I propose a CV representation of initial *s*C-clusters as in (5a). In a medial *s*C-cluster, V_1 is of course filled by a vowel (e.g. [a] in (1e)). V_1 licenses the empty V_2 inside the cluster in both cases, so there is no need for Magic Licensing.

(5) a.
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        →                          →                              →
C  V₁  C  V₂  C  V        C  V  C  V  C  V₃  C  V        C  V  C  V  C  V
    ＼    |   |              |   ⌙→    |   |   |           |   |    ＼   |
    s      p   e            k   aː      [p    r]  a        f   a      tː  o
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My analysis uses strict CV representations (in terms of Lowenstamm 1996), utilising trochaic (left-to-right) proper government (PG) (following Rowicka 1999). The empty V_3 inside the branching onset [pr] in (5b) is licensed by the infrasegmental government contracted by the flanking consonants (Scheer 1999). The heavy stressed rhyme requirement corresponds in this approach to the demand on stressed positions to head a PG domain (NB not every PG domain is interpreted as stress). In an open "rhyme" this is achieved by lengthening the vowel (5b). In a closed "rhyme" the PG domain is already present (5c). (5c) also shows the resulting representation of RS: vowel lengthening and gemination are thus two ways of satisfying the weight requirement. Before an *s*C-cluster, RS does not apply because the stressed vowel can fill the V_1-position in (5a) instead of the [s], becoming the head of a PG domain. In Portugese, the nasal can take up the initial empty onset, similarly to Kaye's analysis.

The next question is why it is only [s] that can be represented as (5a) word-initially, and not any other consonant that can be a medial coda. We expect this to follow from its melodic make-up, |**A H**| in Element Theory (Backley 2011). (In addition to the resonance elements **I**, **A**, **U**, the elements **ʔ** 'stop', **H** 'noise' and **L** 'nasal/voice' are employed.) In fact, this can be understood on the basis of the structure in (5a): we need a segment that is both vocalic and consonantal to occupy a V and a C position at the same time. And this is true of [s]: it contains **A** which is the most vocalic element and **H** which is clearly consonantal. The other consonants with **A** resonance either do not possess a consonantal element [r], or they also contain **ʔ** [t, d, n]. But the stop element is the most resistant to occur in a V position (and it is also an antagonist of **A**). In some languages, **L** and/or **I** can be included in the expression when voiced and/or palato-alveolar fricatives are (also) licit here. The question of **U** remains unresolved at present.

Another question is whether it is possible for [s] to branch on the following V position. This would clearly not work for Italian and Portugese, but I will argue that it is exactly what happens in English. Here too, phonotactic restrictions applying to initial *s*C-clusters differ from those on branching onsets. Still, the two groups can also pattern together, for example, in triggering indefinite article allomorphy: *an apple* vs. *a pear, a trick, a spark*. In addition, *s*C-clusters can be preceded by long vowels (e.g. [ˈiːstə] 'easter') and even consonants ([tekst] 'text'). All these facts follow from a representation branching on the right, as I will show.

Finally, the proposed representation is identical to that of syllabic consonants (where the direction of branching has also been shown to be language specific), thus it is somewhat abstract. However, it is supported by the finding on English that [s] is in fact longer in *#sk* than in either *s#k* or *sk#* (Byrd 1994).

Conclusion. Analysing [s] in initial *s*C-clusters as branching on a neighbouring V position resolves the mystery of its licensing, as well as sheds light on why it is exactly [s] that behaves in this peculiar way.

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