Coronal Underspecification and the $*CC_iVC_i$ Constraint*

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0   Introduction

This is a "squib-like" paper which is by and large "negativistic" in the sense that its basic objective is not to offer an explanation of the phenomenon discussed but it rather intends to show that a current explanation is untenable. The phenomenon I will examine is the English phonotactic constraint which excludes strings like /*spaɪp/ or /*klæl/. This more-or-less obscure phonotactic constraint has recently received some attention in the literature (Sanchez 1990; Davis 1991).

This paper is organized in the following way: in section **1,** I will describe the phenomenon itself and point out what it is that requires an explanation, and in section **2,** I discuss and attempt to refute a recent explanation offered.

1   The constraint

To the best of my knowledge Fudge (1969) was the first who pointed out that in English the last phoneme of a prevocalic consonant cluster cannot be identical with the first postvocalic consonant, *i.e.* $*CC_iVC_i$. Since then the constraint has cropped up in different works (Clements & Keyser 1983; Davis 1984; Fudge 1987; Harrington *et al.* 1987; Cairns 1988; Clements 1988; Sanchez 1990; Davis 1991). What is interesting, however, is that the details of the constraint are very often different: for Fudge (1969), Clements & Keyser (1983) and Sanchez (1990), for instance, it is a syllable structure constraint (SSC) — Davis (1984, 1991) considers it a morpheme structure constraint (MSC). Clements & Keyser (1983) seem to think that it is only true of sCVC strings where the vowel is short and the consonant is not /t/ (*spop).[1] Clements (1988) speaks of a constraint which disallows CRVR sequences (where V is any vowel) if R is a nasal (*smam, *snam, *snan) or the two Rs are identical liquids (*flil but frill). Cairns (1988) suggests that in addition to the usual $*CC_iVC_i$ sequence the constraint also excludes

strings like *spirrup*. According to Sanchez (1990) the constraint is $*CC_iVC_i$, but it does not hold if $C_i=/t/$ (*state*), or if the consonant preceding the first C_i is /p/ (*prairie*). As there is so much variation I want to make clear what my position is.[2]

First, the length of the vowel is irrelevant. If the constraint only held true of short vowelled strings, we would expect a significant number of CC_iVVC_i strings violating it. This is not the case: /*skVVk/ is just as unattested (ill-formed) as /*skVk/. Second, I claim that the constraint should be given in its most general form: $*CC_iV(V)C_i$, *i.e.* without reference to major classes like sonorant, obstruent, liquid, *etc.*[3] There seems to be one systematic exception: the string is well-formed if $C_i=/t/$ (/p/ is not exceptional in any way). All other CCV(V)C items in which the consonants flanking the vowel are identical are exceptional (irregular): *e.g. slalom, flail, drear, prairie, Drury, etc.* Furthermore, the constraint does not hold if there is a intervening morpheme boundary cutting across the CCVC sequence: *spy-plane, prerequisite, slowly, dyspepsia etc.* This shows (I agree with Davis (1984, 1991)) that $*CC_iVC_i$ is a constraint on the shape of morphemes (MSC) and not syllables (SSC). This is confirmed by the fact that the constraint holds even if the postvocalic consonant is syllabified with another syllable. Indeed, if it were an SSC, $\$CC_iV\$C_i$ strings should be possible as opposed to $\$CC_iVC_i\$$ strings (where \$ is a syllable boundary). In fact, the two types behave in the same way *brory* is just as ill-formed as *bror* or *brort*. A further proof is that the constraint holds even if the prevocalic consonant cluster is not a possible syllable initial cluster. As an example consider prevocalic plosive+plosive clusters and liquid+plosive clusters ('0' in an intersection means that the cluster in question is always heteromorphemic in English and thus is irrelevant):

(1) **CC_iVC_i where C and C_i are plosives**

	p	**t**	**k**	**b**	**d**	**g**
p	0	optate	—	0	0	0
t	—	0	—	0	0	0
k	—	tektite	0	0	0	0
b	0	0	0	0	—	—
d	0	0	0	—	0	—
g	0	0	0	—	—	0

(2) **CC_iVC_i where C=liquid and C_i=plosive**
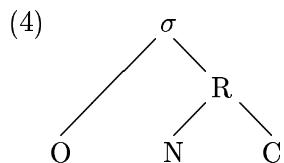
	p	**t**	**k**	**b**	**d**	**g**
l	—	multitude	—	—	—	—
r	—	partite	—	—	—	—

It is obvious from (1) and (2) that heterosyllabic clusters behave in the same way as clusters which are possible onsets. Even the systematic exception is the same: /t/. The counterexamples that one can find are only apparent as the CCVC strings in them are always divided by a morpheme boundary:[4] *lambdoid, cupcake, fruitcake, wallpaper, underpeopled, absorbable, Turkic, welded, rewarded, grandbaby, etc.* To sum up, the constraint bans he segmental melody[5] $CC_iV(V)C_i$ intramorphemically. This can be stated as follows:
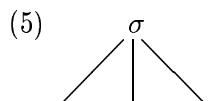
(3) $*CC_iV(V)C_i$ unless $C_i=$/t/, domain: morpheme.

Notice that (3) makes no reference to the syllable, it disallows the sequence $CC_iV(V)C_i$ regardless of how it is syllabified.[6]

Let us now examine the significance of the phenomenon, *i.e.* the explanations. The first thing that is strange about (3) is that the consonants between which a phonotactic relation seems to hold are not adjacent. This is not what we would expect: phonotactic constraints normally hold between adjacent positions. For an account which postulates a hierarchical syllable structure of the kind shown in (4):

(4)

this is particularly inconvenient, as (part of) the motivation behind the immediate constituent structure of the syllable is that we expect phonotactic constraints to hold within constituents but not across them (Selkirk 1982). For instance restrictions are normal and expected within the Rhyme and the Onset, but not between the Rhyme and the Onset. Our constraint is even worse: it appears to hold between a member of the Rhyme and a member of the Onset. This is why Clements and Keyser (1983) used this constraint to argue for a "flat" syllable structure:

(5)

If the structure of the syllable is like that in (5), then restrictions between the Onset and the Nucleus, and between the Nucleus and the Coda are equally expected.[7]

Much of the problem evaporates if we consider the constraint an MSC. It simply ceases to be relevant in an argument for or against the syllabic structures in (4) and (5).

What remains to be explained, however, is the fact that the consonants whose combination is excluded are not adjacent. What is more, the combination of identical consonants across a vowel is only excluded if the prevocalic one is preceded by another consonant—otherwise, identical consonants may flank a vowel: *pipe, kick, maim, lily, gig, hubbub, etc.* Furthermore, identical consonants are also possible in a CCVC sequence as the first and the last consonant: *plop, fluff, crack, slice, etc.*

Thus, the questions to be answered are

(6) a. Why are vowels transparent and consonants not?
 b. Why does it matter that another consonant precedes the prevocalic consonant?
 c. Why is it that /t/ (and not some other phoneme(s)) behaves differently?

(6a) and (6b) concern the constraint (3) itself and (6c) the systematic exception to (3).

In this paper I will ignore the perplexing questions (6a) and (6b)[8] and will concentrate on a proposed answer to (6c), which—in my view—is untenable.

2   The explanation

Davis (1991) attempts to give an answer to question (6c) based on underspecification. He assumes that segments are trees of features and that in the feature tree the Place node dominates the articulator nodes Labial, Coronal and Dorsal (*cf.* Halle to appear, McCarthy 1988). Features and nodes may be underspecified (left out) in representations and redundancy rules ordered later supply the missing features. One of the reasons why underspecification is useful is that it helps to explain transparency. Suppose that we have a segment Z that is underspecified for a certain feature (or node) [F] and there is a segment Y which is not. If then we have a constraint which bans sequences of segments which are [F], then this rule would exclude the sequence YY but would permit the sequence ZY (and YZ, ZZ) since Z is not specified for [F] at this point. Davis basically uses this line of reasoning.

According to him coronals (in English) are special because they lack the Place node in the underlying representation. The evidence is a version of the $*CC_iVC_i$ constraint:

(7) In monomorphemic words in sCVC clusters the consonants flanking the vowel may not be homorganic unless they are coronal.

(7) is an MSC which permits words like *state, status, etc.* because it bans identical Place Nodes in segments flanking the vowel and /t/ as a coronal has no Place Node at the level where MSCs apply. At a later level, where SSCs apply, the Place Node must be present in coronals too because there are SSCs which crucially refer to it: /tl/ and /dl/ are banned syllable initially.

As Davis himself points out his claim is in direct contradiction to *e.g.* Mester and Itô (1989) who maintain that in MSCs the unmarked place has no special status.

Notice that Davis' treatment crucially relies on two things:

(8) a. the theoretical assumption that MSCs apply earlier than SSCs
b. and a matter of observational adequacy: that all coronals are treated in a special way by the constraint.

I claim that (8a) is not necessarily true and (8b) is false.

Note that if SSCs and MSCs can apply at the same level (if there are SSCs that hold underlyingly) then the constraint excluding syllable-initial /tl, dl/ is actually an argument against the special status of coronals manifested in their having no Place Node—it shows that reference is made to the Place Node of coronals at a level where MSCs apply. It seems plausible to assume that the primary difference between SSCs and MSCs is their **domain** of application not the **level** where they apply: MSCs and SSCs apply underlyingly and SSCs may reapply later. After all, both express phonotactic regularities. Indeed, one may ask the question what could happen between the application of MSCs and the first application of SSCs other than feature fill-in by redundancy rules (like the one which supplies the Place node for coronals)—stress, for instance, is assigned very early and requires the prior assignment of syllable structure. If only redundancy rules separate the two levels then their separation is difficult to justify.

Let us now examine the claim that all coronals are treated in a special way by the constraint. In fact Davis qualifies this statement somewhat by saying that "the MSC evidence is inconclusive concerning the lack of the Place Node in coronal sonorants" (1991 : 58). The problem is that not only *smVm* is excluded, but *snVn, slVl, srVr* too in spite of the fact that the latter are coronals. Davis tries to handle this problem by saying that these are really excluded by separate and different constraints. The strings with the coronal liquids are excluded by an MSC which refers to the feature [lateral] (*C[α lateral]V[α lateral] in sonorants) and there is another MSC

which excludes *s[+nasal]V[+nasal] sequences (*snVm* and *smVn* are also unattested).

The hypothesis about the liquids works, but the problem is that it is not falsifiable as /l/ is the only [+lateral] in the system. Thus, **in principle** we can never tell if both liquids, one of them, or neither lack(s) the Place Node. The only thing that may argue against Davis' treatment is that "aesthetically" it would be nicer if the same constraint that excludes other CC_iVC_i clusters would exclude *ClVl and *CrVr too. But we will never know as it is impossible to find evidence bearing on the matter.

The nasals are a different matter, because Davis' MSC is untrue in a generalized form. Although Davis mostly speaks about sC_iVC_i sequences, it is clear that the constraint excluding them[9] is just a special case of the more general constraint $*CC_iVC_i$. We have seen that this constraint also holds (as it should since it is an MSC) if the prevocalic cluster is not a possible syllable initial cluster. If we also examine C[+nasal]V[+nasal] strings where the prevocalic C[+nasal] cluster is not a possible syllable initial cluster, then we find that the constraint cannot refer to the feature [nasal]. Monomorphemic C[+nasal]V[+nasal] strings are actually possible and attested if the nasals are not homorganic (identical). Consider the following examples: *apartment, department, badminton, augment, figment, magnum, jasmine, talisman, almanac, almond* (US), *almoner* (US), *culminate, dolmen, determine, hormone, German, harmony, ferment, garment, sermon, etc.* Interestingly, /n/ does not seem to be treated as special: CnVn strings are missing just as well as CmVm strings.[10] Thus, nasals are subject to the same constraint as the other consonants and for them coronality is not an unmarked articulation.

Indeed, the only consonant which is special with respect to the constraint discussed (and this constraint alone) is /t/. Even /d/ seems to behave like the other consonants (*cf.* (1) and (2)).[11] Taken together with the doubts about the level difference between MSCs and SSCs, this considerably weakens Davis' position. According to the MSC evidence if anything is underspecified for place in English, it is /t/ alone and not coronals in general. But even the behaviour of /t/ can be interpreted as special with reference to just this constraint, and arguably this is not due to its lack of a place node since other phonotactic regularities (which may apply at the same level) do not treat it in any special way.

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NOTES

* This paper is a modified version of Törkenczy (1993) 'On explanations of *CC$_i$VC$_i$' in Kövecses, ed., *Voices of friendship: Linguistic essays in honor of László T. András 1930–1993*. Budapest: Department of American Studies, Eötvös Loránd University.

[1] I will use the normal English orthography unless the clarity of exposition requires transcriptions. The dialect transcribed is Standard British English, but I assume that prepausal and preconsonantal /r/ may be present underlyingly.

[2] Notice that we are still mostly talking about the "lowest" level of observational adequacy.

[3] Actually, the constraint may be even more general. The absence of words like /*smVp/, /*smVb/ (*vs. snap*) seems to indicate that it may be place of articulation rather than segment identity that is involved, although compare *swoop* (*cf.* Harrington *et al.* (1987) and Davis (1991)).

[4] Clements (1987) suggests that only level 2 suffixes count. This is not correct: the suffix type does not matter. *Turkic, anarchic, hierarchical, etc.* are not irregular precisely because *-ic* is a separate morpheme; and *-ic* is undoubtedly a level 1 suffix.

[5] By "melody" I mean melody in the autosegmental sense, *i.e.* a sequence of features on a tier which is not the skeleton.

[6] There is a way in which syllable structure may have a role: in principle the constraint might not hold if within a morpheme a CCV syllable is followed by a VC syllable and the consonants immediately preceding and following the vowels are identical: $CC_iV(V)\$VC_i$. I have not investigated this matter.

[7] See Fudge (1987) for a critique.

[8] This is partly because to the best of my knowledge no serious answer has been proposed to these questions. I have no answer either, but I suspect that phonotactic constraints of this type, *i.e.* constraints that refer to non-adjacent segments/features are only possible as MSCs and never as syllable structure constraints. Thus, I think that any answer will also have to give account of what is possible as SSC as opposed to an MSC.

[9] It is immaterial whether this constraint refers to homorganicity or segmental identity.

[10] *Lightning* and *morning* are possible exceptions.

[11] As might be expected, there are some counterexamples (*e.g. indeed, candid, candidate, splendid*), but the number is significantly lower than the number of examples with /t/.

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