# Phonological licensing and linguistic variation

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*Abstract*
In some Strict CV versions of Government Phonology, the smallest syllabic unit, CV, involves a relation of licensing, whereby the internal complexity of the consonant as well as its formal configurations with the preceding coda or the following complement of the branching onset require support from the following nucleus. With the use of empty nuclei, a number of syllabic contexts in which phonological phenomena such as devoicing or epenthesis occur may be uniformly identified as pre-nuclear, and linguistic variation can be defined as resulting from the tension between the complexity of the consonantal position and the licensing properties of the nuclear one. The problem is that some register or pragmatics related variation seems to involve a conscious manipulation of phonological licensing, thus creating a problem for modularity and the competence – performance divide.

*Key words*: licensing, variation, modularity, epenthesis, voicing

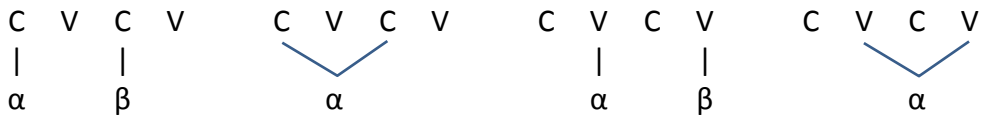
## 1. Introduction

Phonological computation is a broad term referring to all phonological operations whose list and nature is strictly dependent on the adopted model. Thus, for example, it refers to rules and their arrangement (ordering) in classical derivational frameworks, or to constraint interaction and generation and evaluation of candidates in Optimality Theory. In Standard Government Phonology (SGP) (Kaye, Lowenstamm and Vergnaud 1985, 1990; Kaye 1990, 1995; Harris 1990, 1994; Charette 1990), which is assumed for our discussion, computation is severely restricted by the nature of phonological representations and involves the interaction between two lateral forces: government and licensing, which organize phonological representation and are responsible for causality of phonological phenomena. The latter are, in turn, limited to composition and decomposition of internal representation of segments.

To elaborate a little more on the last point, Government Phonology comprises two independent theories: one of representation and the other of computation (e.g. Scheer and Kula, in press). For example, the most popular current assumption concerning syllabic representation is that of Strict CV (Lowenstamm 1996) which claims that phonological representation is a string of CV units, regardless of the types of strings observed on the surface. Thus, clusters, geminates, diphthongs and long vowels contain an empty V or C in their representation.

(1)

a. ***cluster*** b. ***geminate*** c. ***diphthong*** c. ***long vowel***



One aspect of phonological computation operating on this type of representation is the arrangement of relations of government and licensing between particular V and C positions, which will be elaborated on below.

Another representational aspect of GP is that subsegmental representation is composed of elements which are privative cognitive categories. The list of elements in GP differs in various proposals. For our purposes, we may assume the most commonly used set which is a slightly modified version of that proposed in Harris (1994). There are three vocalic elements |I, A, U| corresponding to the corner vowels [i, a, u]. Their combinations give other vowels, e.g. |I-A| = [e], |U-A| = [o], |U-I| = [ü], and |I-U-A| = [ö]. It is immediately obvious what is meant by decomposition as an example of computation in this model. For example, vowel reduction [e] > [i] and [o] >[u] in unstressed nuclei in languages such as Bulgarian and Catalan is a case of reduction of |I-A| to |I|, and |U-A| to |U|, respectively. The process can be described as |A|-loss in unstressed positions. Composition in vowel systems is a reverse process whereby an element is added as a result of spreading, for example, in vowel harmony.

The other elements that are typically used in GP analyses are respectively: |H| for high tone on vowels and aspiration of obstruents, |L| for low tone on vowels and full voicing of obstruents, |N| for nasality of vowels and consonants, |h| for noise in fricatives and release in stops, |ʔ| for occlusion in stops, but also sometimes in nasal consonants and laterals. Thus, for example, if [b] is phonologically |L-U-ʔ-h|, that is, fully voiced released bilabial plosive, then devoicing is a loss of |L|, leaving |U-ʔ-h|, that is, [p]; spirantization is a loss of [ʔ], leaving |U-h|, that is [f]. Further lenition can yield |U|, that is [w], or |h|, that is, [h].[1]

An important aspect of GP is the assumption of modularity in grammar, in that it is composed of a number of independent computational systems. Each of these modules operates with domain specific vocabulary and its own computational system (e.g. Scheer 2011, 2012, 2014). This does not mean, however, that some properties of other modules should not be present in, say, phonology. The Government Phonology programme itself strove to look for parallels between syntax and phonology. Government and licensing are examples of this analogy.

Another important distinction in generative studies is that between linguistic knowledge and performance (*langue* vs. *parole*). In this paper we will look at some phenomena which under certain conditions and in some analyses seem to show that the distinction is obliterated, or at least not as clear as one might wish. Our focus will be on licensing as a computational mechanism organizing phonological representation in the sense that it will sanction, or not, particular configurations at the syllabic level, and will be responsible for the ability of entire segments or just subsegmental properties (elements) to be phonetically realized, or not. The problem that will be of interest to us is that sometimes it looks like licensing (a phonological computational mechanism) is manipulated from outside phonology proper. If it is the case then either modularity or licensing itself is in need of revision.

## 2. Complexity Scales and Licensing

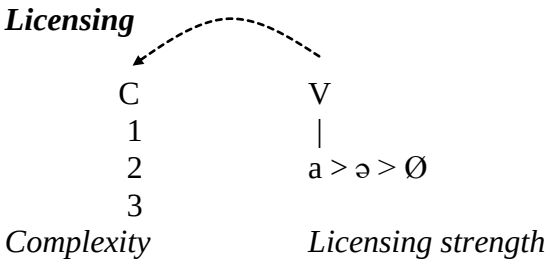
As mentioned above, in GP representation is independent of computation. In the discussion below we assume the melodic, element-based representation briefly introduced above, and the Strict CV view on syllable structure. The particular use of such computational notions as government and licensing will be that of the Complexity Scales and Licensing (CSL) model

[1] For a variety of proposals concerning elements in GP see, e.g. Backley (2011), Backley and Takahashi (1998), Harris (1990, 1994), Harris and Lindsey (1995), Jensen (1994), Kaye, Lowenstamm and Vergnaud (1985), Nasukawa (2005), Pöchtrager (2006), Rennison and Neubarth (2003), Scheer (2004).

introduced in Cyran (2010). CSL uses government and licensing in a very similar way to SGP.[2]

Generally, licensing is responsible for the distribution of subsegmental contrasts (Harris 1994, 1997) and structural configurations (Charette 1990; Cyran 2010). The basic licensing relation which is relevant to our discussion is that between a nucleus and the preceding onset. There are two important aspects of this relation: substantive complexity of the licensee and the licensing strength of the licenser.

(2)




The complexity of the licensed segment is calculated by the number of elements making up its representation. The idea is that more elements require more licensing strength. While absence, or weak licensing results in melodic depletion (lenition) or some other repairs, of which more will be said below. Let us look at examples of consonants and their complexities, which are commensurate to licensing demand.

(3) ***Substantive complexity scale***

| ***Sonorants*** < | ***Plain obstruents*** < | ***Complex obstruents*** |
|---|---|---|
| 1-2 elements | 2-3 elements | 3-4 elements |
| /j/=\|I\|, /w/=\|U\|, /r/=\|A\| | /v/=\|U,h\| | /$p^h$/=\|U,h,ʔ,H\| |
| /l/=\|A,ʔ \|, /n/=\|A,N\| | /p/=\|U,h,ʔ \| | /b/=\|U,h,ʔ,L\| |
| /m/=\|U,N\| | /f/=\|U,h,H\| | |

Sonorants are 'light' and easy to license because they contain more or less 1-2 elements. Plain obstruents contain 2-3 elements, while complex obstruents 3-4. This rather simplified presentation of elemental complexity is meant to illustrate a possible way of expressing the relation between segmental classes and substantive complexity. Whether a given segment will behave like a complex or plain obstruent depends on whether a given phenomenon takes particular melodies into account or just complexity.

As we will see in the following section the relation of licensing is better understood if we also take into account inherent properties of licensing strength of different types of nuclei. Full vowels are the strongest, while empty nuclei (Ø) are the weakest licensers. Between them are prosodically weak (unstressed) but melodically filled nuclei (ə). Thus, we are dealing with a scale of licensing strength (a > ə > Ø) interacting with a complexity scale. The cut-off points are a decision of individual languages.

Before we look at the first set of data, the role of empty nuclei in phonological representation needs to be clarified. Empty nuclei fall out of the general design of

[2] Where obvious differences are irrelevant they will not be mentioned. See Cyran (2010) for a detailed discussion.

phonological representations which refer to skeleton and autosegmental (melodic) tier as two distinct levels: a position C or V may contain melodic primes but it may be also devoid of any melodic representation. Then, some general conditions must govern distribution of such objects. Note that the Strict CV assumption also makes a claim that every C is followed by a V position. Thus, empty nuclei are present inside clusters but also at the end of words ending in consonants. At this point, it is interesting to note that the weak prosodic position of word-final consonants now follows not from the fact that they are in the coda (in fact they are now in the onset!) but from the fact that it is licensed by a final empty nucleus (FEN). In CSL, the main criterion for allowing empty nuclear positions in the representation is their ability to license. Otherwise they are not used.

After this brief theoretical introduction let us look at some phenomena in which licensing plays a crucial role. The problem, however, is that this relation is not only phonology dependent.

## 3. Some cases of apparent licensing manipulation in CSL

In this section we look at some instances where we can observe manipulation of licensing strength depending on what appears to be extra-phonological conditions.

### 3.1. Malayalam

Arguing for a hypothesis that Malayalam has no codas, K. P. Mohanan (1986: 74) provides an interesting distinction between formal and colloquial registers. Lexical word-final consonants surface as such in both registers only if they are /m/ or /n/ (4a). These are considered exceptions to the no-coda hypothesis. If forms end in an obstruent, both registers exhibit ə-epenthesis (4c). Let us assume that the phenomenon of ə-epenthesis in question is caused by the type of consonant that occurs word-finally. As for other sonorants, their behaviour with respect to triggering epenthesis differs depending on the register as shown in (4b). In formal Malayalam, these sonorants do not cause ə-epenthesis, thus providing more 'exceptions' to the no-coda hypothesis, while in the colloquial variety they do.[3] (4d), on the other hand, contains data illustrating words borrowed from Sanskrit, which are lexicalized with an affix containing a full vowel. It is important to note that these forms contain obstruents with additional laryngeal specification as voiced, voiceless aspirated, and voiced aspirated respectively.

(4)

| | ***formal*** | ***colloquial*** | ***gloss*** |
|---|---|---|---|
| a. | maāram | maāram | 'tree' |
| | awan | awan | 'he' |
| b. | aaṇ | aaṇə | 'male' |
| | awaḷ | awaḷə | 'she' |
| | paal | paalə | 'milk' |
| | wayar | wayarə | 'stomach' |
| c. | kaaṯə | kaaṯə | 'ear' |
| | maaṣə | maaṣə | 'teacher' |

[3] The data come from K.P. Mohanan (1982, 1986), T. Mohanan (1989) and Steriade (1981). We follow the transcription used in T. Mohanan (1989): ç = retroflex, ç̪ = dental, c̄ = palatalised.

| | | | |
|---|---|---|---|
| d. | maḏ**a**m | maḏ**a**m | ‘intoxication’ |
| | paaṭ$^{h}$**a**m | paaṭ$^{h}$**a**m | ‘lesson’ |
| | laab$^{h}$**a**m | laab$^{h}$**a**m | ‘profit’ |

We leave aside the problem that under K. P. Mohanan’s interpretation of the data, the different registers of the same language may have quite disparate syllable structures: the sonorants are codas in formal Malayalam and onsets in colloquial speech. In the phonological model adopted here, all word-final consonants are onsets followed by an empty nucleus (Kaye 1990, Harris and Gussmann 1998), and ə-epenthesis does not change their syllabic affiliation.

Cyran (2001) provides an explanation of the pattern observed in (4) which is based on licensing strength of nuclei interacting with segmental complexity of the consonants in question. Assuming that /m, n/ are easier to license, for example, because they are melodically less complex than other sonorants, it becomes clear that we are dealing with a sort of scale of melodic / internal complexity corresponding to different types of licensers that are required by such objects. Uncontroversially, obstruents are more complex than sonorants, and laryngeally marked obstruents are more complex than the neutral obstruents, as we saw in (3). Thus, we can provide precise cut-off points at which a given type of segments requires increasingly stronger licensers, as shown below in (5).

(5)

| | informal | formal | example |
|---|---|---|---|
| Sonorants<br>[m], [n] | [Ø] | [Ø] | awa[n] ‘he’<br>maāra[m] ‘tree’ |
| [l̩], [r], [n̩]<br>~2 elements | [ə] ←----→ | [Ø] | awa[l̩ə] ‘she’<br>waya[rə]’stomach’ |
| Obstruents<br>~3 elements | [ə] | [ə] | kaṭalaa[sə] ‘paper’<br>wira[kə] ‘firewood’ |
| Sanskrit obstruents<br>~4 elements (3+Lar) | [a] | [a] | laa[b$^{h}$a]m ‘profit’<br>paa[ṭ$^{h}$a]m ‘lesson’<br>ma[ḏa]m ‘intoxication’ |

The scale of licensers (Ø < ə < a) corresponds to a more or less precise scale of melodic complexity ($C_{1\text{-}2\ elements} < C_{3\ elements} < C_{4\ elements}$). The ə-epenthesis is understood as resulting from the pressure exerted on the final empty nucleus by the consonants, which are more complex melodically than [m] and [n]. Thus, if /Ø/ is insufficient, then /ə/ appears. The realisation of the empty nucleus provides the necessary melodic licensing, but does not involve resyllabification, because the final consonants were onsets from the start. If /ə/ is not sufficient, then a full vowel is used. Thus, we are dealing with a simple assumption that different complexities require different strength from the nuclei that license them.

This analysis, however, raises the question of the nature of the licensing strength adjustments depending on register. Clearly, we are dealing with either strengthening of the licensing properties of the final empty nucleus in formal speech (4b), or their weakening in informal speech. Either way, we seem to be mixing two orders: phonological computation (competence) and pragmatic considerations (performance). This contravenes not only the basis of Generativism in general, but also the strict modularity assumption of current GP (e.g. Scheer 2014). The question is how one can control or manipulate computational mechanisms in production. From a strict modular perspective this is not possible.

At this stage we can only speculate on possible ways of dealing with this problem from a modular perspective. Firstly, one needs to look into the nature of ə-epenthesis, especially with respect to its motivation. One line of inquiry that can be pursued is that this type of epenthesis should be relegated from phonology to, say, implementation, or spell-out. Then, at the phonological level we would still have an empty nucleus licensing particular complexities. Depending on the configurations (complexity of consonants) the empty nucleus would be spelled-out as empty or filled with some default melody (schwa). Thus, spell-out alone would be responsible for the epenthesis. And the difference in register would then boil down to the different spell-out (implementation) rules for different registers. This move saves modularity but also leads to a situation in which we seem to be losing the grip on the causality of ə-epenthesis as a direct phonological effect. It is now more difficult to claim that the empty nucleus is vocalized (phonetic fact) in order to provide licensing (phonological fact). And the very concept of licensing strength is also undermined: it no longer seems to be part of phonological computation.

Interestingly, epenthesis of this type is also problematic for Standard GP in which final empty nuclei are silent when they are licensed to be so by a parameter. Word-final epenthesis as a phonological phenomenon would have to be viewed as a case of revoking of the final parameter. CSL is only slightly better off. It claims that FEN is used in phonological systems not because some parameter licenses it, but because it is itself granted licensing properties. In fact, it can be assigned licensing properties of varying strength (Cyran 2010).

A more dramatic alternative that seems to present itself in order to be able to capture the apparent communication between phonology and pragmatics would be to admit that licensing, or at least the type of licensing we discuss here, is not a phonological computational mechanism. A number of relations which have been viewed as cases of licensing in SGP or CSL analyses are not even expressible in some modern versions of GP, such as, e.g. the Lateral Theory of Phonology (LTP) (Scheer 2004; Scheer and Ziková 2010).

We leave this question unanswered and look at other cases of similar phonology-external manipulation of licensing strength.

### 3.2. Dutch

The following Dutch examples also illustrate a variation with respect to vowel epenthesis, which is somehow related to the function of the schwa vowel as a licenser. This time, however, we are primarily talking about licensing of a formal configuration rather than a single segment. Although the ultimate reason for epenthesis is certainly some sort of unfulfilled licensing requirement as well. Additionally, we observe an identical scale of licensing strength of different types of nuclei. Let us first look at the data in (6), in which, depending on what type of nucleus follows the lexical cluster, the latter is broken up by epenthesis obligatorily, optionally, or it remains integral.[4]

[4] The data come from various sources (Booij 1995; Kager 1989; Kager and Zonneveld 1986; Trommelen 1984; van Oostendorp 1995, 2000), while the analysis is based on Cyran (2010).

(6) ***phological repesentation***

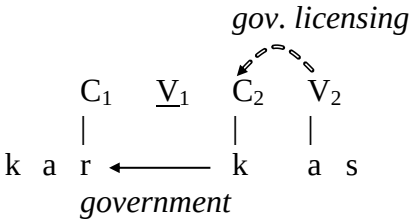
| | | | | | |
|---|---|---|---|---|---|
| a. | | ***ə-epenthesis obligatory*** | RØTØ ⟹ | | RəT |
| | /harØpØ/ | > | [harəp] harp ‘harp’ | ↓ | |
| | /kɛrØkØ/ | > | [kɛrək] kerk ‘church’ | | |
| | /balØkØ/ | > | [bələk] balk ‘beam’ | | |
| | /hɛlØmØ/ | > | [hɛləm] helm ‘helmet’ | | |
| b. | | ***ə-epenthesis optional*** | RØTə ⟹ | | R(ə)Tə |
| | /karØpər/ | > | [kar(ə)pər] karper ‘carp’ | ↓ | |
| | /kɛrØkər/ | > | [kɛr(ə)kər] kerker ‘dungeon’ | | |
| | /stalØkər/ | > | [stal(ə)kər] Stalker ‘Stalker’ | | |
| | /hɛlØmər/ | > | [hɛl(ə)mər] Helmer ‘first name’ | | |
| c. | | ***ə-epenthesis excluded*** | RØTa ⟹ | | RTa |
| | /harØpun/ | > | [harpun] harpoen ‘harpoon’ | | |
| | /karØkas/ | > | [karkas] karkas ‘carcass’ | | |
| | /balØkan/ | > | [balkan] Balkan ‘Balkan’ | | |
| | /hɛlØma/ | > | [hɛlma] Helma ‘first name’ | | |

In (6) we are dealing with classical ‘coda-onset’ contacts in which a sonorant is not homorganic with the following obstruents. In GP literature, this type of cluster is referred to as an RT (Sonorant + Obstruent) cluster. The Strict CV representation forces us to say that, phonologically speaking, all the RT sequences in (6) in fact contain a lexical empty nucleus (…RØT…). In (6a), this sequence, is lexically followed by a domain-final empty nucleus (FEN), and the relevant fragment of the representation is therefore /…RØTØ/. In (6b), the post-RT nucleus is a lexical schwa (/…RØTə/), while in (6c), it is a full vowel (/…RØTa/).

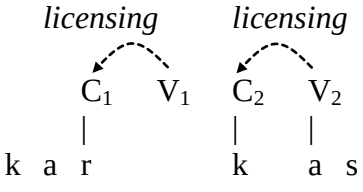
Given the fact that the presence or absence of epenthesis in the data in (6) is correlated with the type of nucleus that follows the lexical RT, Cyran (2010) attributes the phenomena to the relative licensing strength of these nuclei. True RT clusters in CSL form a governing relation which is licensed by the following nucleus.[5] Thus, the phonological interpretation of the representations in (6) is the following: if a nucleus can government license the obstruent to govern the preceding sonorant, then the relation of government is contracted and the intervening empty nucleus is locked by it. This is illustrated in (7a) below, and relates to the data in (6c), in which epenthesis is excluded. Only the relevant part of the representation is fully shown.

(7) /karØkas/ > [karkas] *karkas* ‘carcass’

a. ***true cluster***




b. ***bogus cluster***



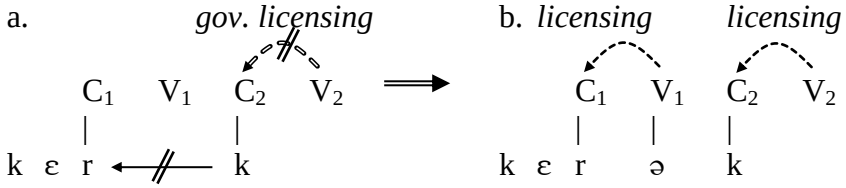

[5] This licensing is called Government Licensing in GP (Charette 1990).

Being locked within the governing relation $V_1$ is not called to license its onset $C_1$ in (7a). It is assumed that the entire cluster forms a sort of compound structure and is licensed by $V_2$.

However, an alternative analysis of the forms in (6c) is possible, in which the relation of government is not established (7b). Instead, $V_2$ licenses only its own onset $C_2$, while $V_1$ licenses $C_1$. This type of RT cluster is bogus, and such an analysis, although possible, makes it more difficult to see the relation between the type of nucleus under $V_2$ and epenthesis, especially in comparison with the other data in (6). At this stage it is not possible to ascertain which analysis is better.

At the opposite side of the spectrum of effects presented in (6) are the forms with a final empty nucleus, in which epenthesis is obligatory. It may be argued that the phenomenon in fact has a double causality. First, the FEN is unable to government license the $C_2$ to govern its complement $C_1$ to the left (8a). At this point, we are dealing with a bogus cluster, that is, one in which the intervening nucleus $V_1$ is not locked and it must license its onset.

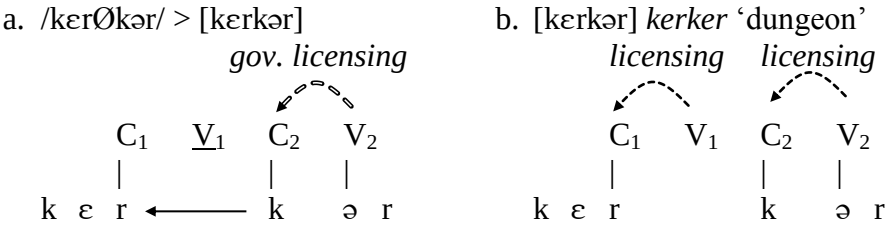
(8) /kɛrØkØ/ > [kɛrək] *kerk* 'church'




Given that the intervening empty nucleus $V_1$ should be able to license its onset, which we know on the basis of (7b), the epenthesis in (8b) can only have one cause: the ban on sequences of empty nuclei which is assumed in most versions of GP.[6] A sequence of two empty nuclei must be repaired by vocalization of the left-hand one, as shown in (8b), where each onset receives ordinary licensing. Under this analysis, the RT cluster is epenthesized before a final empty nucleus firstly because no government could be contracted between the consonants (lack of government licensing), and secondly, the emergent sequence of two empty nuclei must be resolved by vocalizing $V_1$. Thus, the forms of the type given in (6a) do not really provide sufficient verification as to which of the two analyses in (7) is correct.

Such evidence seems to be provided by the data in (6b), in which epenthesis is subject to variation which occurs across speakers, but also across styles and registers. Epenthesis is more common in non-standard varieties of Dutch. Similarly to (7), the forms with no epenthesis can be analyzed as true or bogus clusters, that is, either the governing relation is contracted and $V_1$ locked (9a), or the cluster is bogus and $V_1$ is a licenser of its onset (9b).

(9) ***standard / formal Dutch***

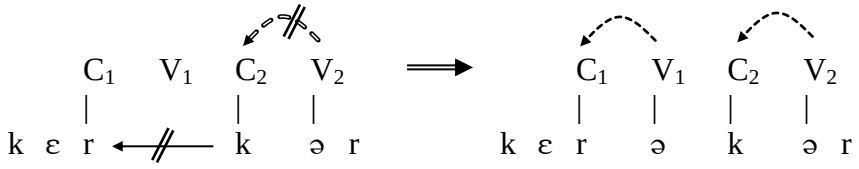



[6] Except LTP in which FEN can govern preceding empty nuclei in some systems, in which case, the causality of the epenthesis must lie outside $V_2$, as well.

The tale-telling forms, however, are those in which a pre-schwa RT is epenthesized. As shown below in (10). We know that $V_2$ cannot government license the cluster, otherwise there would be no epenthesis, as the preceding nucleus would be locked parallel to the one in (9a). As for (10b), we are certain that $V_1$ is not vocalized due to the ban on sequences of empty nuclei because it is followed by a lexical schwa. Thus, the only reason for the vocalization of $V_1$ is rather its inability to fulfill its licensing duties with respect to the preceding onset $C_1$.

(10) ***non-standard / informal Dutch***

a. /kɛrØkər/ > [kɛrəkər] b. [kɛrəkər] *kerker* 'dungeon'




The forms with schwa in $V_2$ allow us to make an informed decision as to which analysis of the motivation of schwa epenthesis is right. If the internal empty nucleus is not able to license its onset, then the bogus analysis of in [kɛrkər] *kerker* 'dungeon' in (9b) and [karkas] *karkas* 'carcass' in (7b) must be rejected, and the relevant distinction is between true clusters, that is, governing relations licensed by the following nucleus as in (7a) and (9a) and those structures in which such governing relations cannot be contracted because $V_2$ cannot provide the required government licensing, as shown in (8a) and (9a). Once $V_1$ is left unlocked, it must vocalize because word-internal empty nuclei are not licensers in Dutch, and not because of some ban on sequences of empty nuclei. In other words, the licensing properties of $V_1$ are stable in all the cases: it is not a licenser. On the other hand, the ultimate cause of the epenthesis is the due to the government licensing properties of $V_2$, due to which $V_1$ is or is not called to do licensing.

Returning to the register variation in (6b) we can now be more precise with respect to the causality of schwa epenthesis and the conditions underlying the variation. First and foremost the licensing properties of the schwa in $V_2$ must be assumed to be responsible for the variation. The government licensing properties of that vowel are stronger in standard / formal Dutch and weaker in non-standard / informal variety of this language. The manipulation of the licensing properties of the internal empty nucleus to achieve the same results is not possible, because we would have to assume that it concerns only those internal empty nuclei which are followed by a schwa in the following nucleus, and not, for example, when followed by a full vowel. The nature of this interdependence would be difficult if not impossible to establish.

Thus, yet again, we observe that register variation may be captured by a manipulation of the licensing properties of a licenser. While interspeaker variation of this type might be simply ascribed to slightly different parameter settings in individual grammars, the switch between informal and formal speech, and consequently presence or absence of epenthesis, adds to the list of problematic cases of manipulating a computational mechanism from outside the phonological module.[7]

[7] It must be added that there is an alternative repair strategy to epenthesis in Dutch. Namely, the liquid may be vocalized (Collins and Mees 2003, van Oostendorp pc.). This is an expected course of action when the internal empty nucleus is called to license its onset but it is unable to fulfil its duty as a licenser: the predicted two repair strategies are precisely epenthesis, that is, strengthening of the licenser, or lenition (weakening) of the onset, the target of licensing.

### 3.3. Polish voicing neutralization

Final obstruent devoicing (FOD) in Polish has been subject to a number of formal analyses (Bethin 1984, 1992; Cyran 2014; Gussmann 1992, 2007; Rubach 1996, 2008). There are at least two challenges for these approaches. One involves a growing body of experimental results which demonstrate that FOD, not only in Polish, does not involve complete neutralization of the laryngeal contrast (e.g. Slowiaczek and Dinnsen 1985).[8] The debate concerning neutralization, however, is not over as some experimental results point in exactly the opposite direction (Jassem and Richter 1989; Fourakis and Iverson 1984). It is noted in Gussmann (2007: 296) that 'the variants are controlled by word familiarity, frequency, tempo of speech, degree of speech monitoring by speakers, and the like'.

We are not denying the existence of the problem of incomplete neutralization. However, from the point of view of our discussion the most interesting is the variation observed in forms in which regular devoicing would lead to homophony or unintended rudeness, as in the case of *dób* [dup] 'day, gen.pl.', (11a) which, due to the identical case (genitive plural) is likely to be used in the same context as *dup* [dup] 'backside, gen.pl.' and be therefore ambiguous.

The data in (11a) illustrate a variation in FOD, which is clearly connected with homophony avoidance and which is more likely to occur than in (11b) in which there is no danger of homophony.

(11)

| | | |
|---|---|---|
| a. | ***variation in monitored speech*** | cf. |
| | *kod* [kɔt] ~ [kɔd] 'code' | *kot* [kɔt] 'cat' |
| | *dób* [dup] ~ [dub] 'day, gen.pl.' | *dup* [dup] 'backside, gen.pl.' |
| | *smog* [smɔk] ~ [smog] 'smog' | *smok* [smɔk] 'dragon' |
| | *bóg* [buk] ~ [bug] 'god' | *buk* [buk] 'beech tree' |
| | *mag* [mak] ~ [mag] 'magician' | *mak* [mak] 'poppy' |
| | *maż* [maʃ] ~ [maʒ] 'doodle, imp.' | *masz* [maʃ] 'you have' |
| b. | *bób* [bup] 'broad bean' | --- |
| | *rób* [rup] 'do, imp.' | --- |
| | *maź* [maʑ] 'gunk' | --- |
| | gaz [gas] 'gas' | --- |

The question concerning such data is what type of explanation is required, or can be given, to account for such variation, and why such variation, together with the experimental results showing incomplete neutralization, is problematic for existing formal accounts? First of all, most analyses of FOD refer to delaryngealization which leads to neutralization of the laryngeal contrast. For example, in rule-based analyses using binary features a [+voi] obstruent which effectively becomes a [–voi] obstruent by derivation should be phonologically, and therefore also phonetically, identical to obstruents with a lexical [–voi] specification. This problem cannot be easily bypassed in privative models either. If voiced obstruents in Polish contain |L| (e.g. Gussmann 2007) and the voiceless series lacks a laryngeal category – it is neutral – then FOD defined as L-loss in word-final position produces a neutral object which should be identical to the unmarked series in the same way as in the

[8] For similar results concerning, for example, Russian and German see, e.g. Barry (1988), Port and O'Dell (1985).

binary feature systems mentioned above. Thus neither binary nor privative accounts of FOD sit easily with the experimental results showing incomplete neutralization, or variation.

However, next to representational problems, formal accounts also exhibit serious drawbacks and inconsistencies with variation when it comes to the computation and causality of delaryngealization, and in effect, with the causality of its absence in data such as (11a). If the cause of delaryngealization is captured as resulting from not being syllabified in the onset (Bethin 1984, 1992; Gussmann 1992), or being situated at the edge of a prosodic word (Rubach 1996), then, for these models, the absence of devoicing as a strategy of homophony or rudeness avoidance in, e.g. *dób* [dub] 'day, gen.pl.' must mean that the last consonant is exceptionally syllabified in the onset, even though for these models such syllabification is not even possible. On the other hand, under Rubach (1996) in which FOD occurs at the edge of the prosodic word, cases of absence of devoicing must be viewed as ones in which the relevant word-final consonant is not at the edge of the p-word, except that it is.[9]

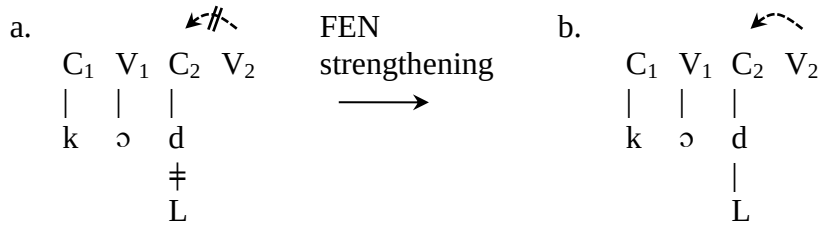
Steriade (1999) also noted the inadequacy of syllable-based formal analyses of devoicing to deal with variation. In her model – Licensing-by-Cue – laryngeal licensing is directly linked to the presence of the relevant perceptual cues and their contextual inhibition. More importantly, she also claims that the sites of neutralization have no uniform characterization in terms of prosodic organization, a point with which we want to disagree. Such uniform characterization is perfectly possible, but it requires a different view on prosody.

The licensing model that follows from the GP assumptions fares a little better than the syllable-based or prosodic-word-based analyses. Firstly, the word-final obstruent is always in the onset (uniform prosodic characterization!), and whether a laryngeal contrast is licensed or not does not entail resyllabification or manipulation of word boundaries. All that changes is the licensing property of FEN with respect to laryngeal categories. Since licensing strength is a scalar property, in that it can be measured in terms of the amount of subsegmental complexity or the complexity of a given formal / syllabic configuration (Cyran 2010), this model seems to be cut out for capturing micro-variation of the type discussed in this paper.

In the two previous cases of register related variation, that is, in Malayalam and Dutch, we observed two strategies of beefing up the licenser so that it can discharge its licensing duties. In Malayalam, the FEN was vocalized (ə-epenthesis) in order to achieve this goal (melodic strengthening). On the other hand, in Dutch the beefing up mechanism consists in increasing the licensing potential of the same type of nucleus – a schwa vowel. Thus, the Dutch case is more abstract, in that the schwa licenser is still a schwa. It is, however, bestowed upon more licensing strength in formal speech.

In the case of Polish *dób, kod*, etc., we seem to be dealing with a doubly abstract situation: it is a case of the strengthening of FEN without vocalization. Thus, it is even more difficult to imagine how the licensing properties of an abstract entity like an empty nucleus can be consciously manipulated.

(12) ***Unguarded speech*** ***Monitored speech***




[9] See, e.g. Strycharczuk (2012: 669) for similar observations concerning variation and problems for syllable-based analyses.

Given that avoidance of homophony is a case of conscious / monitored manipulation of the licensing strength of FEN, our model is able to include variation of this type into the description of Polish voicing without resorting to new mechanisms. However, this happens at a cost. Namely, this phenomenon appears to belong to a domain of interaction between phonological computation and pragmatics. As mentioned earlier with reference to Dutch and Malayalam such micro shifts can be dealt with by assuming the existence of two types of parametric settings (parallel grammars?) which allow for what we observe as switches of register. However, any conscious manipulation of the licensing properties of nuclei is problematic as it violates modularity as well as the competence / performance divide.

## 4. Discussion

We have seen three examples in which licensing, which is a computational mechanism organizing phonological representation and defining strong and weak prosodic positions, appears to be influenced from outside the domain of phonology proper, and indeed from outside the domain of competence. This fact is problematic for formal approaches like Government Phonology as it undermines modularity. In Malayalam, the contravention looks least harmful because the schwa epenthesis is a case of selection of a stronger licenser rather than manipulation of the actual properties of a particular type of nucleus. On the other hand, Dutch and Polish involve strengthening of the licensing properties of schwa and FEN without respective melodic strengthening.

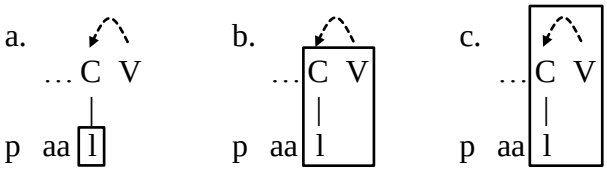
The questions that we need to ask are whether we are dealing with evidence that:

1. there is something wrong with licensing as a phonological computational mechanism?
2. there is something wrong with the modularity assumption?
3. there is something wrong with the analyses proposed for these cases, and that alternative analyses should be sought?

Let us consider some options with respect to the last question, pointing more to potential lines of future inquiry rather than attempting to provide an alibi for not providing a straight answer to the first two questions. Some possible solutions have been signaled above. For example, it is possible, in the case of Malayalam, to relegate the phenomenon of final schwa epenthesis to what is called spell-out, phonetic implementation, or phonetic interpretation. Under strict modularity view (Scheer 2011, 2012, 2014), the effect of phonological operations, which is still a phonological representation (unlike in derivational models) is subject to translation to, say, the phonetic module. The question then is: what exactly is translated and in what way, that is, as what is it translated? Another issue is to what extent we allow the phonetic module to contain computation of some ilk. We may assume that, like in the case of spell-out from morpho-syntax to phonology, not every aspect of the upper module is subject of translation to the lower one, that is, not all aspects of the phonological representation are spelled-out to the phonetic level. Definitely, not everything phonological is part of the phonetic form. This area is still unexplored within GP. Therefore, the points made below are mere speculations at this stage.

Take the example of [paal ~ paalə] ‘milk’ in Malayalam. In (13), we present three options of the amount of phonological information that can get spelled-out. It is either the melodic string alone (13a), the melody and its syllabic affiliation (13b), or, the entire representation including the licensing relation. We must keep it mind that the next question is what these different aspects are spelled-out as into the phonetic module.

(13)




Although option (13a) seems to be the closest to the phonetic form, it may turn out to be insufficient. For example, in some cases the melody of /l/ will be syllabic [l̩], e.g. in English *bottle* [bɒtl]. In such cases, the spell-out must take into account the syllabic affiliation of the lateral melody, that is, at least something like (13b). Thus, even though, two dimensions of the phonological representation are spelled-out, according to (13b), the product of that spell out looks more like a string of phones, where empty nucleus is spelled-out as nothing, because it was empty before spell-out. Recall that allowing schwa epenthesis to occur before spell-out would bring us back to the modularity problem. The problem with (13b) is that we must assume two effects of spell-out. This is because the phonetic module does not work on empty nuclei any more. Thus the question how this variation is effected remains begging, and the question is if we get any closer to a solution in option (13c), which assumes that also the relation of licensing must be somehow translated.

The problems discussed above clearly require further study. It is possible to claim that the marked part of the representation in (13c) contains all the necessary phonological information, including the tension between an onset and its licenser, that allows for being spelled either as [paal] or as [paalə]. The choice might depend on the existence of different spell-out rules for different registers. After all, the implementational level (performance) has access to all sorts of conscious (non-grammatical?) information and strategies such as paradigmatic relations, analogy, homophony, etc. Or, as in the case of voicing neutralization in Polish, we have access to such aspects as word familiarity, influence of spelling, and so on.

Short of being dismissive by assuming that phonetic implementation (spell-out) will deal with problems where purely phonological analysis would have to involve redefinition of the nature of computation or even of the design of entire grammar, we note that the area of post-phonological translation is in need of more serious consideration within the phonological models such as Government Phonology. This work is only beginning.

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