

# Hocus bogus? Licensing paths and voicing in Polish<sup>1</sup>

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## Abstract

The distribution of voicing distinctions within the prosodic word in Polish can be given a uniform description by referring to laryngeal licensing which is discharged by nuclear positions. It is an inherent property of melodically filled nuclei. However, under specific structural conditions, this property can also be inherited by empty nuclei, which are generally not laryngeal licensers and trigger delaryngealization in the preceding onset. The licensing paths established for Polish coincide with those involved in the distribution of long vowels and internuclear lenition in other languages, but they call for a revision of two prominent theories which deal with the distribution of licensing within Government Phonology, that is, Licensing Inheritance and Strict CV.

## Key words

*Polish, laryngeal licensing, licensing inheritance, licensing absorption, bogus cluster, Strict CV, Government Phonology, empty nuclei*

## 1. Introduction

In recent years, studies in laryngeal phonology have advanced greatly on the issue of representation of laryngeal contrasts, but not so much on the principles that govern their distribution in particular phonological positions. This stronger focus on representation is partly due to the dissatisfaction with explanations based on prosodic licensing connected with syllable structure (e.g. Itô 1986, Lombardi 1995).<sup>2</sup> In this paper we return to the idea of laryngeal licensing, which, for convenience, will be called Lar licensing. The problem with prosodic licensing is that it is strictly dependent on the individual theorist's views on syllable structure. Therefore the failure of some syllable theories to capture Lar licensing does not necessarily undermine the concept as long as the theory of syllabification continues to develop. We will look at a number of varying proposals within Government Phonology (GP) beginning with its standard version (SGP) and attempt to put together various more recent proposals such as Lateral Theory of Phonology (LTP), and others to see how different sub-theories of GP handle Lar licensing. While generally the premises of Element Theory (ET) are assumed, the discussion will attempt to be theoretically neutral whenever possible. ET, due to its privativity and reference to melodic complexity gauged by the number of primes, appears to be most compatible with licensing-based approaches in which presence, absence, or relative strength of licensing is referred to.

No particular view of the representation of laryngeal properties is assumed. Instead a generalized reference will be made to the distribution of Lar properties – an ability to host laryngeal contrast – on obstruents in various positions. There are a number of reasons for this move. Firstly, it does not exclude binary proposals in which both series of obstruents are laryngeally specified. Secondly, despite the wide-spread popularity of the approach to laryngeal phonology called Laryngeal Realism (Iverson and Salmons 1995; Harris 1994; Honeybone 2002; Gussmann 2007), which adheres to privativity and non-specification of all sonorants, recent proposals such as Laryngeal Relativism (Cyran 2011, 2014; van der Hulst 2015) have claimed that in some cases the specification is the opposite of what is put forward by the laryngeal realists. Thus, since the actual way of representing laryngeal contrasts is

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<sup>2</sup> See, e.g. Rubach (1996), Steriade (1999).

tangential to our discussion, the discussion will not be more specific than indicating (an x's) ability to bear Lar. Where this is not possible delaryngealization ensues.<sup>3</sup>

One of the most prominent proposals concerning licensing within GP is Licensing Inheritance (LI) (Harris 1994, 1997). LI assumes that a network of licensing paths is established in phonological representation with the source of that licensing being located in the head of the domain (word). The distribution of licensing takes into account foot structure as well as the level of syllabic constituents down to the skeletal positions. This type of licensing is called p-licensing, where 'p' means 'prosodic'. Skeletal positions on the other hand license the melodic material subsumed underneath. This is called a-licensing, where 'a' means 'autosegmental'. The main aim of LI is to provide an integrated theory of neutralization, including laryngeal neutralization, whereby the ability of particular positions within the licensing network to support contrastive melodic primes (some complexity) is directly linked to the fact that p-licensing exhibits asymmetries with respect to strength the further away from the licensing source it is.

Integrating LI into the analysis of the distribution of Lar licensing in Polish will require some changes to the principle itself. It will be demonstrated that there is no view of syllabification within current GP that is able to uniformly capture all the relevant aspects which are crucial to Polish Lar licensing. However, individual scattered analyses seem to have already touched on the need to take a slightly different route with respect to licensing in phonology. The theoretical discussion of minute differences between individual proposals will be kept to a minimum. However, the full picture must involve reference to subtle differences as well as to a battery of phenomena that may appear to be unconnected, for example, lenition, vowel length, vowel~zero alternations, etc.

While trying to limit theoretical assumptions, the view that is adopted with respect to the class of sonorants is that of strict privativity leading to non-specification for Lar in this class of segments. The reason for this is connected to the question which is not normally addressed in ET literature, especially when we look at the divide between vowels and sonorant consonants. The problem of sonorant transparency and opacity with respect to voicing assimilations will be taken up at the end of the paper. Let us now move to a discussion of the distribution of Lar in Polish.

## **2. Distribution of voicing and basic voicing phenomena in Polish**

This section looks at the distribution of the voicing distinction in Polish words and identifies the contexts for neutralization of this contrast. As mentioned above, no particular assumption concerning the representation of the laryngeal contrast with respect to obstruents is made. It is irrelevant to our discussion, although we generally adhere to privativity. The only assumption that is made concerns the mechanism responsible for the ability of a position to hold the distinction or not. Following a long standing tradition, it is claimed that the distribution of voicing is directly related to the distribution of licensing (e.g., Goldsmith 1990; Harris 1994, 1997; Itô 1986; Lombardi 1995). The term, however, will be used in its broad sense, as a representational situation in which the laryngeal category, or categories, or simply a contrast can be maintained.

In the brief review below, the underlined C is the relevant obstruent in various positions. S stands for a sonorant consonant, while V is a vowel. First, we look at the contexts in which the laryngeal distinction is maintained. It is important to remember that the label Lar has no

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<sup>3</sup> Far from ignoring the growing body of experimental studies which reveal incomplete neutralization of voicing in Polish (Slowiaczek and Dinnsen 1985; Strycharczuk 2012), it is assumed in this paper that delaryngealization need not entail complete neutralization, a point which requires a longer discussion, perhaps in another paper. See also Van Oostendorp (2007).

status of a particular phonological proposal for the relevant category: it could be either |H| or |L| in Element Theory, or [+voice] / [-voice] in binary models.

(1) **Lar licensed**

- a. CV baki ‘whiskers’, paki ‘containers’, tom ‘volume’, dom ‘house’
- b. CSV trawa ‘grass’, drewno ‘wood’, dmuchać ‘blow’, kmiotek ‘yokel’
- c. CSSV krnąbrny ‘unruly’, brnąć ‘wade’

The data above show the contexts in which the laryngeal distinction is safe. We may generalize that the laryngeal contrast in Polish is retained in prevocalic position, and also, when one, or even two, sonorant consonants separate the obstruent from the following vowel. It is the absence of the vowel that leads to delaryngealization, as we see in (2) below. In the relevant literature, the context in which laryngeal categories survive has been interpreted as ‘the onset’ (Bethin 1984, 1992; Gussmann 1992). It should be noted, however, that there is a choice of causality here. Referring to onsets means that the prosodic licensing of laryngeal features is effected by the very fact that a category is lodged in the onset position. On the other hand, when we refer to the prevocalic context the burden of licensing may be said to rest directly on the nuclei, which makes a subtle difference. In the former case, Lar licensing is an instance of the a-licensing property of the position in question, while in the latter case, the focus is on the p-licensing property of nuclei. Of course, indirectly, an onset must relate to the presence of a vowel. It should be noted that some aspects suggest immediately that there is something wrong with the concept of onset as a licenser. For example, neither of the pairs *dm* or *km*, nor *krn* or *brn* in (1) look like well-structured onsets. The former pair violate the sonority distance requirement, while the latter pair would have to be treated as ternary onsets. Some evidence will be provided below showing that the clusters do not form a single constituent (onset).

Let us now look at the contexts in which the laryngeal distinction is neutralized, leading to particular static patterns (voicing agreement in obstruent clusters) as well as phonological phenomena such as final obstruent devoicing (FOD), or voicing assimilation (VA), which is typically regressive in Polish.

(2) **Lar unlicensed**

- a. C# waga / wag [vaga ~ vak] ‘weight, nom.sg. / gen.pl.’ (FOD)
- b. CS# dobro / dóbr [dobro ~ dupr] ‘good, nom.sg. / gen.pl.’ (FOD)
- c. CCV kto ‘who’, gdy ‘when’,  
wieś / wsi [v<sup>i</sup>ec ~ fci] ‘village, nom.sg./gen.sg.’ (VA)
- d. CSCV krtań ‘larynx’, grdyka ‘Adam’s apple’  
Jędrek / Jędrka [jendrek ~ jentrka] ‘Andrew, nom.sg. / gen.sg.’ (VA)

The data in (2) show that Lar cannot be maintained in the contexts when no vowel directly follows the relevant (underlined) obstruent. The contexts in (2a, b) are parallel to (1a, b). These forms normally exhibit FOD.<sup>4</sup> The data in (2c, d), show static restrictions as well as alternations involving voicing assimilation in what we can identify as pre-obstruent context, with or without an intervening sonorant. For completeness, we should mention interesting exceptions to (2d). Namely, *krwi* [kr<sup>v</sup>i] ‘blood, gen.sg.’ and *trwać* [trfatç] ‘persist’, which look like cases of (2d), have dialectal forms [krv<sup>i</sup>] and [trvatç] with a voiced [v], which do not show any agreement between the obstruents across a sonorant. Additionally, related words

<sup>4</sup> This also concerns CC clusters, e.g. *gwoździa* / *gwoźdź* [gvɔzdza ~ gvuctç] ‘nail, gen.sg. / nom.sg.’ or *mózgu* / *mózg* [muzgu ~ musk] ‘brain, gen.sg. / nom.sg.’, which will be left aside for the moment.

such as *krewny* [kɛvɲi] ‘relative’ suggest that if there is assimilation in *trwać* and *krwi* it is progressive and not regressive. Following Cyran (2014), these apparent counterexamples are viewed as cases of phonological CSSV (1d) rather than CSCV (2d).

The traditional syllable based analyses of the data in (2) directly or indirectly locate delaryngealization in the coda position, or assume that laryngeal licensing can only occur in onsets (Bethin 1984, 1992, Gussmann 1992). An interesting alternative to syllabic analyses is given in Rubach (1996), who criticizes the syllable-based approaches. However, his own proposal introduces an unwelcome disjunction of causality for delaryngealization. For Rubach, who ascribes to a binary representation of voicing in Polish, there are two rules which deprive an obstruent of the laryngeal node. Neither rule refers to codas, or indeed to onsets. FOD in (2a, b) is due to a rule of deletion of a laryngeal node on an obstruent at the right edge of the prosodic word. Thus, it relates to prosodic licensing by referring to edges rather than to some licensing mechanism. This rule is followed by insertion of the default value for voicing, which supplies [-voice] to unspecified obstruents. On the other hand, pre-obstruent delaryngealization (2c, d) is due to a separate rule of obstruent delinking, whereby an obstruent loses its laryngeal node when adjacent to another laryngeal node in the following obstruent. This rule is solely based on adjacency constraints, and it is followed by spreading of the laryngeal node to the left, producing voicing assimilation (VA). Thus, for Rubach, delaryngealization is due to two disparate causes for the contexts in (2a, b) and (2c, d) respectively. We ignore other complications with this analysis, which are, for example, connected with specification of sonorants, rule ordering, or binary representation of voicing. An alternative analysis which will be sought here attempts to unify the contexts for delaryngealization, but also to include the contexts where Lar is licensed in (1) in the overall picture as well.

To sum up, we have observed that, ignoring sonorant consonants, which appear to be neutral<sup>5</sup> with respect to voicing in Polish, the distribution of the laryngeal distinction expressed by the ability to maintain the Lar specification is very clear and is strictly connected with the presence of vowels, as shown below.

- (3)
- |               |            |               |
|---------------|------------|---------------|
| a.            | b.         | c.            |
| ... C (S)V... | ... C (S)# | ... C (S)C... |
|               | ‡          | ‡             |
| Lar           | Lar        | Lar           |

C - obstruent, (S) - optional sonorant, Lar - laryngeal specification, V - vowel

It is striking how the syllable-based distinction between onset position (3a) on the one hand and coda position on the other (3b, c) imposes itself immediately to anyone familiar with classical assumptions concerning syllable structure (e.g. Kahn 1976). While (3b) seems to represent the final coda, (3c) appear to be the case of an internal coda context. The reintroduction of the syllable to phonological theory eliminated the disjunction in (3b, c). In what follows it will be shown how Government Phonology (Kaye, Lowenstamm and Vergnaud 1985, 1990; Harris 1994, 1997) reintroduces the formal disjunction between internal and final codas, which Harris (1997) then tries to repair by proposing that the commensurability of the two disparate contexts with respect to prosodic positional strength may be derived from the same distance of the relevant position from the licensing source in

<sup>5</sup> This neutrality is often referred to as ‘transparency’. The sonorant consonants typically do not voice obstruents and do not block spreading of voicing properties between obstruents. For some proposals concerning sonorant transparency see, e.g. Rubach (1996, 1997), Cyran (2014).

terms of licensing paths. The disjunction between the word-final position and internal codas is removed in a later development of GP known as Strict CV. However, it appears that whichever syllabic view is taken, it remains quite irrelevant to the distribution of Lar licensing in Polish, as will be shown below.

### 3. Government Phonology and Lar licensing

Let us start by recalling the problems with final codas as viewed from the perspective of SGP (Kaye 1990; Kaye, Lowenstamm and Vergnaud 1990; Harris 1999; Harris and Gussmann 1998). First of all, the word-final consonants are not codas but onsets. Phonologically, they are not pre-vocalic but they are followed by an empty nucleus and are therefore pre-nuclear in most varieties of GP.<sup>6</sup> In Standard GP this was formalized by means of the ‘Coda’ licensing principle (Kaye 1990) which states that a coda must be licensed by the following onset. This principle precludes a final consonant from being syllabified in the coda because there is no following onset to license it. For this reason the consonant is put in the onset and consequently followed by an empty nucleus. The same view on final consonants falls out directly from the CVCV assumption in Strict CV varieties of GP. Thus, the context in (3b) is not a coda. It is an onset followed by a final empty nucleus (FEN). Therefore, structurally speaking, the final consonant finds itself in a context which is formally identical to (3a) in which voicing is licensed. This is not an unwelcome result because now we are able to include the pre-vocalic context under one common denominator with the neutralizing context. The difference lies in the presence or absence of melody in the nucleus that follows its onset. The FEN may also be preceded by a complex onset, that is, a traditional branching onset (Charette 1990; Harris and Gussmann 1998). Thus the same formal context underlies the two situations of neutralization schematized in (3b), that is, *wag* [vak] ‘scale, gen.pl.’ and *dóbr* [dupr] ‘good, gen.pl.’, and both are formally parallel to (3a). The important shift here is that we now refer not to pre-vocalic vs. non-pre-vocalic but more generally to pre-nuclear context, in which the nucleus is either filled or empty.

The only position which could be called ‘coda’ in Standard GP is the non-nuclear rhymal complement followed by an onset as in, e.g. *karta* ‘card’. Admittedly, a comparison of the internal coda and the word-final context is not so obvious in terms of seeking a common denominator, as these are clearly two different structures. This means that we are dealing with a formal disjunction of contexts showing uniform behavior (3b, c) and at the same time a formal conjunction of contexts showing disparate behavior (3a, b). One attempt to unify the final onset (followed by an empty nucleus) with a rhymal complement, identifying both as equally prosodically weak is provided within the theory of Licensing Inheritance (Harris 1997). Put succinctly, Harris proposes that the weakness of the two positions is commensurate if one considers the distance of these positions from the licensing head of the domain. In Strict CV, a later development of GP, the disjunction is again eliminated by putting the so-called internal coda in the onset of a CV sequence in which the nucleus is empty. Thus, both delaryngealization contexts from (3) are onsets followed by an empty nucleus.

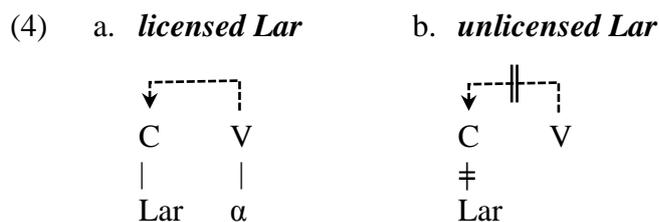
While internal sonorant ‘codas’ may be quite uncontroversial in Polish, there is a problem with internal coda effects on obstruents. In most cases involving data of the type shown in (2) the obstruent cannot be easily placed in the coda. Firstly, in forms like *kto* ‘who’, or *gdy* ‘when’ this would force us to say that these words begin with codas. The automatic response of SGP must be that the first obstruent is followed by an empty nucleus and we are dealing with two separate onsets (Cyran and Gussmann 1999), that is, /kØto/ and /gØdɨ/ respectively. Secondly, most cases of alternations in word-internal obstruents involving VA also involve a vowel~zero alternation suggesting that we are again dealing with an onset followed by an

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<sup>6</sup> For differing views see, e.g. Piggot (1999) or Szigetvári (2001).

empty nucleus, and not a coda, e.g. *żabek / żabka* [ʒabɛk ~ ʒapka] ‘frog, dim.gen.pl. / nom.sg.’ (/ʒabØka/). Finally, in forms like *mędrek / mędrka* [mɛndrɛk ~ mɛntrka] ‘wiseacre, nom.sg. / gen.sg.’ the whole cluster /dr/ does not seem to qualify as coda, let alone the fact that it looks like a complex onset, which it is (Cyran and Gussmann 1999; Cyran 2010). This complex onset is followed by an empty nucleus which is evidenced by the vowel~zero alternation. The only cases of obstruents in internal coda position, by SGP standards, are those in which we are dealing with a true cluster (a governing relation). This can be ascertained only in word-final context, where a lack of vowel ‘epenthesis’ seems to show the underlying adjacency of the consonants. Thus, for example, true coda-onset clusters must be postulated in words like *gwóźdź* [gʷuctɕ] ‘nail’ or *szept* [ʃɛpt] ‘whisper’ because a bogus cluster, that is, one separated by a lexically present empty nucleus, would have to be broken-up word-finally as in, e.g. *łokieć / łokcia* [wɔcɛtɕ ~ wɔktɕa] ‘elbow, nom.sg. / gen.sg.’. Such true clusters are always voiceless word-finally, which means that they may be a result of FOD in some cases.<sup>7</sup>

To conclude, all the contexts in (3) can be identified as pre-nuclear with no need to refer to onsets vs. codas. They are all onsets. The difference between these onsets lies in the types of nuclei that follow. At this point the distinction looks very clear if not unimpressive: filled nuclei (vowels) license Lar, while empty nuclei, whether final or medial, do not. This distinction will be further refined below because it is not exactly correct, but it is now clear that ‘in the onset’ is not an accurate definition of the prosodic position licensing Lar in Polish. It is in onset position that Lar is licensed, but the key to licensing is in the type of nucleus. It will be recalled that most previous analyses of Polish voicing connect the instances of the licensed laryngeal features with their prosodification in the syllable onset, and the delaryngealization is associated with not being in the onset (Bethin 1992), or not being prosodified (Gussmann 1992; Rubach 1996).<sup>8</sup> The causality is now uniform and depends on the distribution of licensing through nuclei. It should be noted that the split of delaryngealization into two unrelated rules, which we observe in Rubach (1996), that is, based on melodic adjacency in one case, and on prosodic placement in the other, does not allow for a uniform treatment of (3b, c), let alone all the contexts in (3) taken together because no common denominator is present in such formulations. Such a unifying factor is a licensing relation between a nucleus and its onset. The distinction between the two types of licensers as identified above is presented in (4).



To this point, the discussion does not go beyond existing analyses of laryngeal licensing within GP (Brockhaus 1992, 1995; Gussmann 2007; Harris 1994, 1997). For completeness, we need to turn again to the context in which Lar is licensed and look at the distinction between true and bogus clusters as well as the consequences of this distinction for our

<sup>7</sup> The phonological interpretations of the so-called true coda-onset clusters may vary. It is possible, following the assumptions of Scheer (2004), and especially Scheer (2012), to view these clusters as separated by an empty nucleus. For this reason, we keep the true CC clusters out of this discussion for the moment.

<sup>8</sup> Steriade (1999) offers a different, perceptual perspective on the delaryngealization contexts and correlates neutralization with positional cue loss. Her proposal also grew out of dissatisfaction with syllable-based and licensing-based analyses.

understanding of laryngeal licensing. So far we have tacitly assumed that in the CSV context the rising sonority cluster is a branching onset, that is, a true cluster (involving a governing relation). Indeed such clusters can be postulated for such words as *trawa* [trava] ‘grass, nom.sg.’, *drażnić* [draʒnitɕ] ‘annoy’. In the absence of positive evidence we do not postulate that these might be bogus clusters. Conversely, they look like well-structured governing relations of the branching onset type. And they do not exhibit vowel~zero alternations. Such clusters also occur word-finally, e.g. *wiatr* [vʲatr] ‘wind, nom.sg.’, *kadr* [katr] ‘frame, nom.sg.’ (FOD). It will be recalled that this context is diagnostic for the true / bogus distinction. If these clusters were bogus, we would expect them to be broken up before the following FEN, because two empty nuclei in a row are not allowed in GP.

Thus, a number of CS clusters in Polish are definitely true clusters. In terms of laryngeal licensing this means that the obstruent receives licensing from the following vowel, and vowels are laryngeal licensers. However, Polish also boasts a lot of bogus CS clusters. Firstly, some CSs exhibit the vowel~zero alternation word-finally that we would expect from bogus clusters, e.g. *cukru* / *cukier* [tsukru ~ tsucer] ‘sugar, gen.sg. / nom.sg.’, *podru* / *puder* [podru ~ puder] ‘powder, gen.sg. / nom.sg.’. These examples show lexically bogus clusters which contain an empty nucleus and are broken-up before FEN. Secondly, there are a number of CS clusters which may be suspected to be bogus on the grounds of melodic restrictions that typically hold in true branching onsets. For example, the clusters [dm] in *dmuchać* [dmuxatɕ] ‘blow’, or [km] in *kmiotek* [kmʲotek] ‘yokel, nom.sg.’ are typically analyzed in GP as containing an empty nucleus, that is, /dØm.../ and /kØm.../ respectively.<sup>9</sup> Additionally, some of these clusters break up, providing direct evidence for the presence of the empty nucleus, e.g. *ćma* / *ciem* [tɕma ~ tɕem] ‘moth, nom.sg. / gen.pl.’, *dnia* / *dzień* [dɲa ~ dʒɛɲ] ‘day, gen.sg. / nom.sg.’. Further evidence for bogus CS clusters also comes from familiar vocalization of prefixes, e.g. *ze-brać* ‘collect’ vs. *z-bryzgać* ‘splash’, but also from theory-internal restrictions on the maximally binary size of branching onsets. Thus, forms like *krnąbrny* ‘unruly’, *krtani* ‘larynx’, *grdyka* ‘Adam’s apple’ must contain an empty nucleus, e.g. /krØn, brØn, krØt, grØd/. It should be noted that the first two cases show that the first branching onset (CS) may host a laryngeal specification, while the latter two cases show agreement in terms of voicing with the following obstruent (2). Here, too, some forms exhibit vowel~zero alternations occurring precisely in the predicted position, that is, CSØC, e.g. *krwi* / *krew* [krʲi ~ krɛf] ‘blood, gen.sg. / nom.sg.’, *brwi* / *brew* [brvʲi ~ brɛf] ‘eyebrow, pl. / sg.’.

All the examples above clearly show something which may turn out to be problematic for the rather naïve distinction into vowels as laryngeal licensers and empty nuclei as non-licensers in Polish. The side by side existence of true and bogus CS clusters in Polish with identical behavior with respect to laryngeal licensing indicates that not only vowels but also some empty nuclei may license Lar. It will be recalled, however, that internal Øs have been shown to fail to license voicing distinctions in, e.g. *kto* ‘who’, *gdy* ‘when’ and especially *wsi* [fci] ‘village, gen.sg.’, which alternates with *wieś* [vʲɛɕ] ‘village, nom.sg.’. Another important observation is that the word-internal empty nuclei in our discussion are postulated on the basis of fairly general diagnostics in the GP tradition without even resorting to its Strict CV descendants. Needless to say, the CVCV models will need to incorporate the same distinctions somehow and explain their particular behavior.

Before we look at possible proposals for Lar licensing, let us identify again the Lar licensing contexts in (5) and non-licensing contexts in (6). The problematic cases are shown in bold.

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<sup>9</sup> Branching onsets with obstruent + nasal are, for example, missing in Modern English. We are not taking a particular position on the actual structure of these clusters in Polish. In fact, it is irrelevant whether a surface CS sequence is or is not a branching onset, as branching onsets behave identically to bogus CS with respect to the distribution of Lar.

(5) *Lar licensed*



(6) *Lar unlicensed*

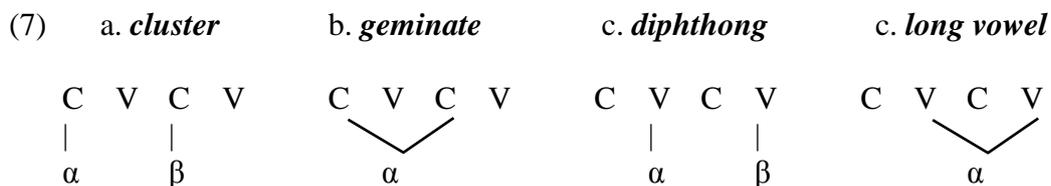


Clearly, the difference between the behavior of Ø in different bogus clusters lies in the nature of the consonant that follows the internal empty nucleus. The relevant distinction is marked by underlining the relevant sequence. Below, we look for a model of licensing that would capture this distinction in a meaningful way, beginning with LTP (Lateral Theory of Phonology) which is the most widespread version of Strict CV today.

**4. Strict CV and Lar licensing contexts in Polish**

Strict CV is a representational assumption that CV is the only syllable type (Lowenstamm 1996, 1999). It completely eliminates the arboreal aspect of representation by replacing it with local lateral relations. One of the most established developments of Strict CV which we will consider is the Lateral Theory of Phonology (LTP), as developed in, for example, Scheer (2004), Ségéral and Scheer (2001), Scheer and Ségéral (2008a, b), Scheer and Ziková (2010), Scheer 2012a, b).<sup>10</sup>

The main underlying idea is that CV is the universal syllabic structure, regardless of what departures from it may be observed on the surface. Thus, consonant clusters, geminates, diphthongs and long vowels are in fact sequences of CV enclosing an empty position, either C or V.



A number of separate CVCV models are currently pursued with differences concerning the organization and the types of relations that can be contracted between various skeletal positions. Here we take the latest version of LTP as proposed in Scheer and Ziková (2010). In LTP all syllabification effects are due to local lateral relations of government (destructive

<sup>10</sup> Work in Strict CV includes also Barillot & Ségéral (2005), Bendjaballah (1999, 2001), Bendjaballah & Haiden (2008), Caratini (2009), Carvalho (2002, 2004, 2008), Cyran (2010), Faust (2014, 2015), Fortuna (2015, 2016), Lahrouchi (2003, 2008), Lahrouchi & Ségéral (2009), Lowenstamm (2003), Kula & Marten (2009), Passino (2009, 2013), Polgárdi (1998), Rizzolo (2007), Rowicka (1999), Szigetvári (1999, 2001, 2007, 2008), Ulfsbjorninn (2014), Zdziebko (2015).

force) and licensing (supportive force), two contradictory and complementary forces discharged by nuclei.

The roles of government and licensing established in LTP arose partly as a reaction to the confusing conflation observed in SGP studies in which the distinction was often blurred. A number of governing relations in SGP used to be referred to as licensing. For example, the relation between a nucleus and its onset is interchangeably called licensing or government (e.g. Charette 1991). The Properly Governed empty nucleus was referred to as p-licensed in, e.g. Kaye, Lowenstamm and Vergnaud (1990), Kaye (1990) and others. The principle of ‘Coda’ licensing mentioned above which says that a coda must be licensed by the following onset is in fact talking about an interconstituent governing relation. For LTP, government and licensing must be distinguished as two separate mechanisms with separate causality.

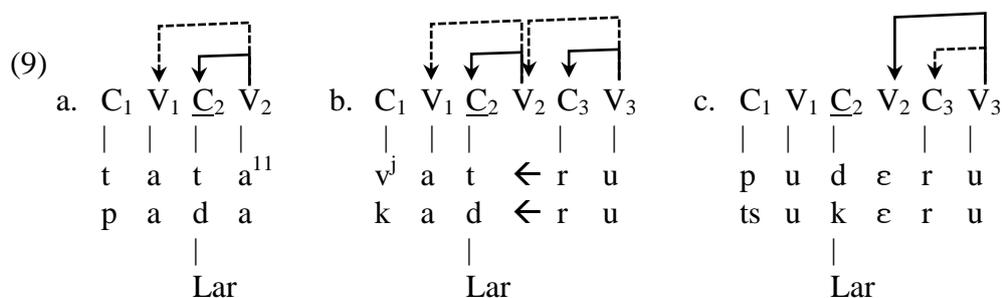
Let us begin with filled nuclei (vowels), relating them to the Lar licensing contexts in (5). All vowels are lateral actors by default. The main principles of interaction between government and licensing are as stated in (8). In the ensuing discussion the governed position (weak) is underlined, while the licensed position (strong) is shown in bold.

(8) *Distribution of lateral forces*

- a. Government first
- b. No double targets

One interesting property of this model is that the lateral forces, which are discharged by a vowel, target the preceding VC sequence, which, as we saw above, is precisely where the distribution of Lar licensing is decided in Polish. (8a) determines which of the two lateral forces has precedence over the other, as both compete for the preceding onset and nucleus. The position on which government lands depends on the representation of the preceding nucleus. If the nucleus is empty then it calls for internuclear government. Thus, in the context  $C\emptyset CV_2$ , the  $V_2$  must govern the preceding empty nucleus (underlined). If the nucleus is filled as in  $CV_1 CV_2$  then the government from  $V_2$  is discharged on the intervening onset, deeming it weak. Licensing always strikes second and takes the ungoverned position of the VC sequence because the forces are complementary. A governed position cannot be at the same time licensed (8b). If  $\emptyset$  in the preceding nucleus is governed in  $C\emptyset CV$ , then the intervening onset is licensed and strong. If the onset is governed as in  $CV_1 CV_2$ , then it is prosodically weak. Given the Lar licensing contexts in (5), we are most interested in forms of the type  $C\emptyset CV$  (9c).

Let us see what the network of government and licensing looks like in the contexts in which Lar is licensed. The relevant obstruent consonant in (9) is underlined. This position supports the laryngeal distinction in Polish. The dotted arrow is licensing, while the solid arrow shows government.



<sup>11</sup> *tata* ‘father’, *pada* ‘fall, 3<sup>rd</sup> person sg.’, *wiatru* ‘wind, gen.sg.’, *kadru* ‘frame, gen.sg.’, *pudru* ‘powder, gen.sg.’, *cukru* ‘sugar, gen.sg.’.

In (9a)  $V_1$  is licensed and  $C_2$  is governed. This configuration places  $C_2$  in a weak position with expected lenition in LTP. Polish does not exhibit intervocalic lenition akin to English, or Spanish. However, if delaryngealization is viewed as a form of lenition (Harris 1997), then it is difficult to see how the  $C_2$  position should maintain the laryngeal properties of obstruents, whatever they are claimed to be. Even if we assume that Polish for some reason does not utilize this lenition context – lenition in weak positions is not obligatory, but merely expected – it is still difficult to see in what way this governed position is any better from those in which we observe delaryngealization in Polish. In fact, we do see the reason: it is the presence vs. absence of melody in the nucleus which directly follows the relevant obstruent. However, LTP does not tap onto this distinction formally, as no licensing relation of the kind shown in (4a) is available here.<sup>12</sup> For the sake of the discussion we will nonetheless continue to refer to Lar licensing as a term denoting absence of delaryngealization.

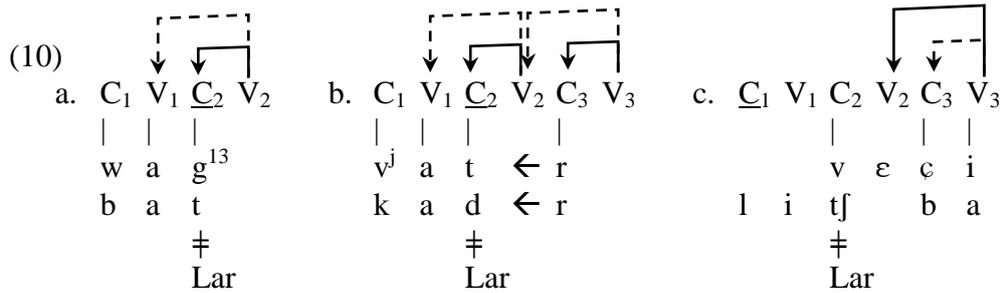
The relevant position in (9b), that is,  $C_2$  is in a similar situation. The differences between (9a) and (9b), which do not concern the distribution of voicing, follow from the presence of so-called Infrasegmental Government (IG) between the sonorant and the preceding obstruent. Details are tangential to our discussion. Suffice it to say that we are dealing with a true CS cluster of the branching onset type.  $V_2$  is silenced by virtue of being sandwiched inside the IG relation. Since it does not call for government from  $V_3$ , government from the latter falls on  $C_3$ , while  $V_2$  is in fact licensed. Such nuclei are claimed to be lateral actors in the latest version of LTP, a point which will become crucial in our later discussion. Thus,  $V_2$  governs  $C_2$  and licenses the preceding vowel in accordance with the regulations in (8). It will be noted that this puts  $C_2$  of (9a) and  $C_2$  of (9b) in seemingly the same type of formal situation. The relevant obstruent is governed. The two representations differ, however, with respect to the type of nucleus that governs the obstruent. It is filled with melody in (9a) and empty in (9b). However, this has no consequences for Lar licensing. Admittedly, it is slightly counterintuitive that governed (weak) positions should keep the laryngeal distinction, but at least the representations predict a uniform behavior of (9a, b). Another noteworthy observation that must be made at this stage is that the laryngeal distinction is maintained not only in front of a vowel (9a), but also in front of an empty nucleus which is an actor. This agrees with our earlier observation in (5). However, this observation concerned both true and bogus CS clusters, not just the true ones.

The problem is that the obstruents in the bogus clusters in (9c) are in a markedly different formal situation from (9a, b), while the outcome – maintaining Lar – should be the same. In (9c),  $V_2$  contains a floating melody which vocalizes in the nominative (*puder, cukier*), when followed by an empty nucleus. However, in the representations in (9c)  $V_2$  is governed by  $V_3$  and being governed, rather than licensed, it is itself not a lateral actor. Hence, no arrows stem from that position. Thus, the relevant  $C_2$  position in (9c) differs from the other representations in (9), although the effects with respect to Lar licensing are the same. Neither structure experiences delaryngealization yet there is no common formal denominator for Lar licensing.

An additional complication appears when we look at the representations of the forms in which Lar is not licensed. Notice that in (10b), below, the delaryngealization is due to the absence of melody in  $V_3$ . Thus, for  $C_2$  to keep the laryngeal distinction, the following empty  $V_2$  should not be just licensed, it must be licensed by a  $V_3$  with melody. Only a real vowel can pass on the Lar licensing properties to other positions, it seems. However, the biggest problem with LTP is that no Lar licensing is even vaguely visible in the model and is yet to be established.

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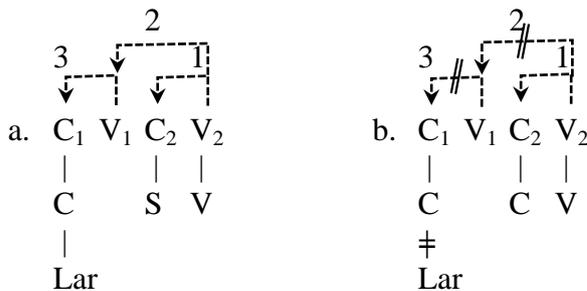
<sup>12</sup> For more discussion on the need to supplement LTP with, perhaps, different type of licensing relations resembling the SGP proposals encapsulated in, e.g. Licensing Inheritance (Harris 1994, 1997), see, e.g. Fortuna (2015), Kula and Marten (2009), Scheer and Cyran (in press).



As for the other structures in (10), we may now conclude that Lar is lost in an onset that is followed by an empty nucleus that is itself not licensed by a vowel. This concerns V<sub>2</sub> in (10a). On the other hand, V<sub>2</sub> in (10c) is not licensed by the following vowel but rather governed. This, however, does not exhaust the cases of contradictory behavior of empty nuclei in current LTP. If we compare (9c) and (10c), V<sub>2</sub> is not a lateral actor in either case, but it allows for the laryngeal specification in the preceding onset in the former but not in the latter. We note that the only difference between the two situations is that C<sub>3</sub> is occupied by a sonorant in (9c) but by an obstruent in (10c). Thus, clearly, the structural conditions for Lar licensing before an empty nucleus (C<sub>1</sub>∅C<sub>2</sub>V<sub>2</sub>) require a different formal description than through the network of government and licensing of the LTP type.

In the illustration below we show the arrangement of licensing which is actually required to talk about Lar licensing in Polish. Thus, we deliberately merge the types of arrows in (11) into just one property – licensing – and show its path as well as conditioning. This, however, is no longer LTP, though one might think of it as the necessary addition to LTP as it is, if Lar licensing is to be described formally. It will be noted that (11) alters LTP in only one, though crucial, respect, namely, both targets of a lateral actor are licensed, while government is not shown. Thus, the paths are the same, except that only one lateral force is used.

(11) *Desired Lar licensing paths for Polish*



As shown in (11a), the conditioning of Lar licensing by word-internal empty nuclei comprises the presence of a vocalic melody in V<sub>2</sub> and a sonorant consonant rather than an obstruent in C<sub>2</sub>. Since we have identified the cause for the failure of Lar licensing to lie in the nature of C<sub>2</sub>, we mark the failure of the internuclear licensing V<sub>1</sub>-V<sub>2</sub> (step 2), which negatively affects step 3 and consequently leads to delaryngealization. Below we look a number of more or less related proposals within GP that will allow us to understand the configurations in (11) by capturing the distinction between (11a) and (11b) formally. We begin with Licensing Inheritance (Harris 1997), from which the terms ‘path’ and ‘step’ are borrowed.

<sup>13</sup> *wag* ‘scale, gen.sg.’, *bat* ‘whip’, *wiatr* ‘wind, nom.sg.’, *kadr* ‘frame, nom.sg.’, *wsi* ‘willage, gen.sg.’, *liczba* ‘number, nom.sg.’.

## 5. Licensing Inheritance and licensing paths

Licensing Inheritance (LI) arose in the context of Standard GP with branching syllabic constituents. However, Harris (1997) extends his proposal to bogus clusters, which in a sense correspond to the structures under discussion. However, his examples show disparate behavior of true and bogus clusters. LI is a coherent proposal of an integrated theory of neutralization in which a system of distribution of licensing potential within a prosodic word interacts with a melodic system based on complexity (number) of privative categories called elements. The main idea is that the ability of a position to maintain melodic material is directly connected with its status within the prosodic hierarchy. Lenition, and indeed delaryngealization, take the form of complexity depletion in prosodically weak positions. Thus, the proposal provides a direct causal link between prosodic structure and melodic effects. The distribution of licensing in LI is strictly connected with the metrical structure taking into account positions of consonants within feet. For example, the relative prosodic weakness of foot-internal (intervocalic) consonants is explained by the status of the following weak nucleus as a licenser. Recall that in LTP, the same effect is captured by the distribution of government and licensing: intervocalic consonants are always governed. Additionally, LTP does not refer to foot structure. There is no direct link between foot structure and distribution of voicing contrasts in Polish. The licensing paths in (11) are not elaborated on in Harris (1997) because the paper did not deal with distinctions in licensing properties of empty nuclei, other than the simple fact that empty nuclei are inherently weaker licensers than full vowels. This does not mean that (11) shows something unpredicted by LI. In this sense, we are merely providing extra facets to LI here. In our discussion below we adopt the idea of paths as a reference to the distribution of licensing. We will also refer to inheritance of licensing properties from other prosodic sources, while such concepts as distance from the head (steps) do not seem to play a role in Lar licensing in Polish. Harris defines LI in the following way (Harris 1997: 340).

### (12) *Licensing Inheritance*

A licensed position inherits its a-licensing potential from its licenser.

Harris uses a terminological distinction between a-licensing (autosegmental) and p-licensing (prosodic). Thus in a CV situation, the vowel / nucleus p-licenses its consonant / onset which in turn is or is not able to a-license the subsegmental properties such as Lar. The most clear distinction between types of p-licensers is that between vowels and empty nuclei. Generally, the situation is clear: Lar is a-licensed in onsets which are p-licensed by vowels. However, as we remember from our discussion above, the main problem in the distribution of p-licensing in Polish is to capture a distinction between two types of empty nuclei which either are Lar p-licensers (CØSV) or not (CØCV) as shown in (11). The licensing paths observed in (11) have nothing to do with foot structure, although it is not impossible that they may eventually be incorporated into higher prosodic structure. This, however, would be of no consequence for the Lar distribution in Polish. What the paths in (11) show are licensing relations at what we can call various levels of adjacency. Firstly, a vowel licenses its onset at the level of direct interconstituent adjacency, and secondly, it also licenses the nucleus which is adjacent to it at the level of nuclear projection. It must be stressed that we are only talking about a situation in which the licensed nucleus is empty. Now, licensing from a nucleus is understood as aiming at two targets, not one.

It seems that both LI and LTP seem to ignore the intervening onset in the distribution of prosodic mechanisms, in that both models focus on the prosodic situation of that consonant rather than on the possibility that this consonant might actually affect further distribution of

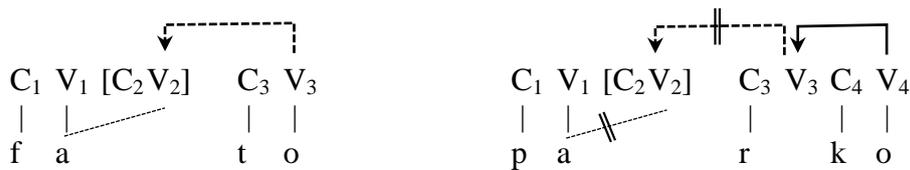
prosodic relations. Thus, both licensing paths of LI, and the arrangement of government and licensing in LTP, overlook the causal relationship between the members of the VC sequence. It will be noted that in (11), both representations involve three steps on the licensing path from the source to the obstruent in question. Thus the difference is not in the number of paths but in what occurs on the way. Let us assume that the p-licensing properties of the empty nucleus are directly inherited from the following p-licenser but the amount of this p-licensing is subject to depletion due to the other p-licensing relation that the vowel is involved in. This depletion is known in the Strict CV literature as absorption.

## 6. Licensing absorption

In this section we look at instances of p-licensing absorption which exist in the literature, but which have been proposed for different phenomena than Lar licensing. They are all similar in the sense that internuclear p-licensing inheritance is assumed to be absorbed by an intervening onset. We begin with licensing vocalic quantity in LTP.

Scheer (2004: 171) proposes that alternating long vowels whether lexical or arising through tonic lengthening must be licensed by the following nucleus. The failure to do so results in shortness. Compare the analysis of Italian *fato* [fa:to] ‘destiny’ with tonic lengthening and *parko* [parko] ‘park’ with the closed syllable shortness effect.

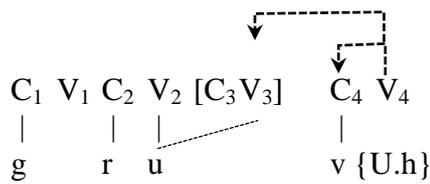
- (13) a. *fato* [fa:to] ‘destiny’                      b. *parko* [parko] ‘park’



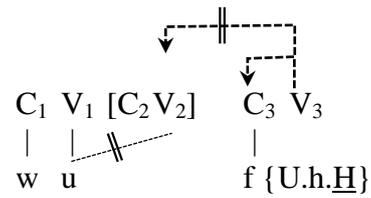
The analysis of tonic lengthening in Italian proposes that an empty [CV] is inserted after stressed vowels. Let us assume that it is also inserted in (13b) in order to show why it is not licensed. For the vocalic melody to spread from V<sub>1</sub> to V<sub>2</sub> the latter must be licensed by V<sub>3</sub>. This is what happens in (13a). On the other hand (13b) shows a situation in which V<sub>2</sub> cannot be licensed because V<sub>3</sub> is empty (governed by V<sub>4</sub>). Such nuclei are not lateral actors in LTP, so length is precluded in (13b).

There are languages which show the shortness effect no so much in particular syllabic configurations (closed syllable), but because a particular class of single onsets blocks length, and the difference between the blocking and permitting length consonants can be melodically rather than syllabically defined. Zdziebko (2012) provides an analysis of the celebrated Aitken’s Law, also known as the Scottish Vowel Length Rule (e.g. Lass 1984). In this regional variety of English vowel length before a single consonant word-finally is predictable and depends on the type of consonant that follows. Zdziebko looks into the representation of consonants in that language and concludes that vowel length is allowed as long as the following onset contains no more than two elements. Thus he refers to the internal complexity (number of privative categories) of segments using Element Theory as a representational property which hinders vowel length licensing. Let us look at the representations illustrating this point adapted slightly for our purposes (Zdziebko 2012: 163).

(14) a. *groove* [gru:v]



b. *woof* [wuf]



Zdziebko formulates the depletion of p-licensing from  $V_3$  as the Licensing Absorption hypothesis (2012: 102).

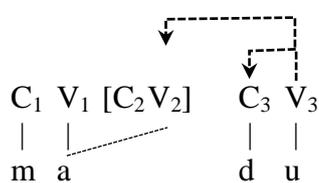
(15) **Licensing Absorption**

Within a [VC] domain, the licensing potential affecting a V is inversely proportional to the substantive complexity of a C

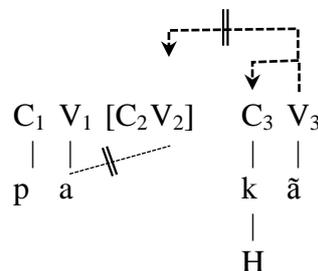
The [VC] domain, of course, defines the targets of licensing from the following nucleus, and not a phonotactic domain in the common sense. Recall from the previous section that a nucleus is not only directly adjacent to its onset, but also to the preceding nucleus at a nuclear projection. Thus the situation closely resembles some aspects of the distribution of laryngeal contrasts in Polish. In fact, the licensing paths are identical. The difference is that the V in our discussion is empty and would normally require government in LTP, not licensing. The structure of alternating long vowels always calls for licensing in LTP, not government. Zdziebko's analysis differs theoretically from LTP in that it includes the C that follows the long vowel as a target of licensing rather than government. The members of the [VC] domain compete for licensing from the same source, but there is no choice involved as to which target is selected. Both are legitimate targets. Thus, like with the analysis of Lar distribution in Polish, the analysis of vowel length in Scottish English requires a modification of LTP to the effect that the tug of war between p-licensing targets somehow be incorporated into the model.

A similar analysis of a similar phenomenon – tonic lengthening – in Breton is given in Bednarska-Adamowicz (2016). Here, vowel length depends on whether the following onset is fortis or lenis (p. 109).

(16) a. *madoù* [ma:du] 'good, pl.'

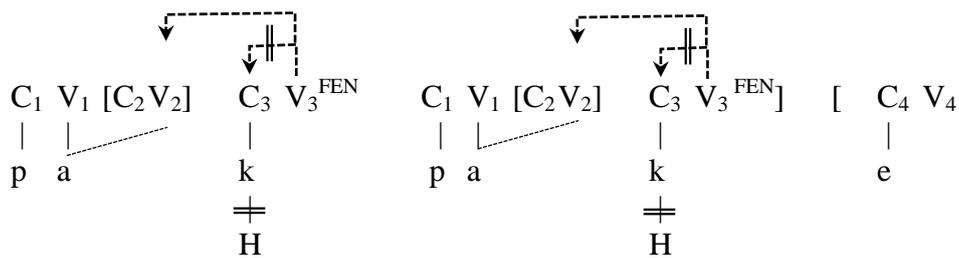


b. *pakañ* [pakã] 'to pack'



The absorbing property of the intervening fortis consonant is claimed to be due to the presence of the laryngeal category [H]. It is interesting how the conflict between the targets of licensing is resolved if the final nucleus is empty, such as in forms with no final vowel. This time the obstruent is delaryngealized for which there are two pieces of evidence. Firstly the vowel lengthened in (17a), and the obstruent is passively voiced in a sandhi context (17b). Only a lenis obstruent can be passively voiced.

- (17) a. *pak* [pa:k] ‘packet’                      b. *pak eo* [pa:g e] ‘it is a packet’



Thus, Breton provides additional evidence for the competition for p-licensing between a V and the following C showing that the tug of war may be resolved either in favor of the intervening onset or in favor of vowel length. Very much like in Polish, the final empty nucleus is not strong enough to license the laryngeal category. Once this property is out of the way, FEN is able to license vowel length, as it does across lenis obstruents. We see that licensing properties of nuclei must be regarded in fact as a complex set of licensing abilities with respect to laryngeal categories, vowel length licensing, as well as other autosegmental licensing. In Breton, full vowels may license vowel length but only if the licensing is not absorbed. FEN in Breton, can do the same but the final empty nuclei are unable to license the laryngeal element.

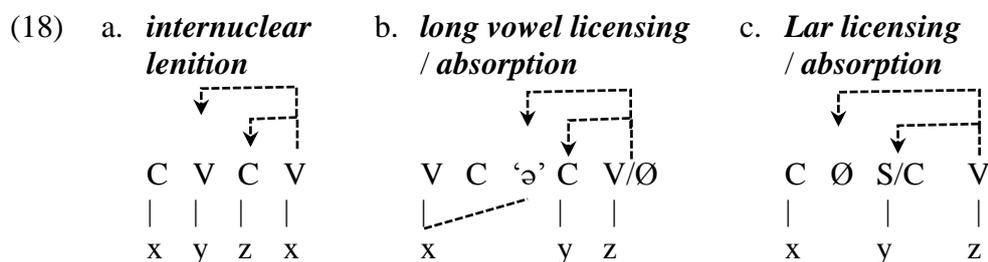
An interesting challenge for both LTP and Licensing Inheritance with respect to the distribution of licensing has been proposed by Kula and Marten (2009). The authors suggest that strong and weak positions can be defined by referring to only one lateral force, that is, licensing (against LTP). But the licensing paths are different from LI. For example, for Harris (1997), an intervocalic onset following a stressed vowel (head of the foot) is weak because it will be licensed by the nucleus in the weak branch of the foot, which itself inherits licensing from the head of the foot. For Kula and Marten, the weakness of the intervocalic onset does not follow from the foot structure but from the fact that its nucleus licenses the onset and the preceding nucleus, very much in the way that our VC domains are licensed. Thus, the two targets enforce a division of the licensing potential of the licenser, which is different from word-initial position in which the onset gets all the licensing. This proposal goes against LI, however, in that it directs the licensing path from the nucleus lodged under the weak branch of the foot at the nucleus in the strong branch. For LI this would mean that the head is licensed by its complement. The idea has not been fully worked out but it presents itself as a viable alternative to currently entertained approaches to prosodic strength in GP including LTP and LI.<sup>14</sup> It is at the same time most compatible with the licensing paths that seem to be necessary in order to capture the Lar licensing in Polish.

Above, we have seen two configurations of the same context in which a [VC] sequence competes for licensing from the same source, the following nucleus.<sup>15</sup> It is not really a domain in the usual sense. Rather, it is a domain of targets of licensing from the following nucleus. One case involves licensing of vowel length, in which the V belongs to a preceding long vowel. This position is sometimes identified with a schwa-like vowel (e.g. Cyran 2010). Although it is illustrated by an empty nucleus (in fact an empty CV), the nucleus does not call for government. It is a position that identifies the melody of the preceding nucleus if it is licensed to do so by the following one. The examples of Scottish English and Breton show that the absorbing property of the melodic representation may be a particular type of category: [H] in Breton, or complexity over 2 elements in Scottish English. The other case of absorption concerns intervocalic onsets. Here, it is the internuclear relation that absorbs licensing

<sup>14</sup> Some problems connected with this proposal are enumerated in Scheer and Cyran (in press).

<sup>15</sup> See also Fortuna (2015).

strength resulting in lenition of the intervocalic onset. Finally, our use of Lar licensing inheritance fills in another piece of the puzzle as it refers to  $\emptyset CV$ , in which the empty nucleus does not inherit Lar licensing properties from the vowel due to absorption. The three situations form a typology of licensing targets:  $[VC]$ - $[\emptyset C]$ - $[\emptyset C]$ , which is illustrated below.



It will be recalled that in LTP an empty nucleus, such as the one in (18c), must be governed and should not be involved in any licensing as a target or trigger (lateral actor). In Licensing Inheritance, on the other hand, the licensing of C by the following V in each instance of CV is already in place. However, empty nuclei are assumed to be inherently weak licensers rather than subject to absorption of potentially inherited properties. Nevertheless, there is nothing in LI that would prevent the licensing path from continuing from the nucleus to the preceding empty nucleus. The only amendment to LI would be that the licensing of the VC sequence takes the form of a competition which may result in absorption. Again, a statement that is in no way incompatible with the premises of LI.

Thus the idea that licensing seems to be ‘divided’ for both positions in the preceding VC has been around for some time within GP. We have seen that there are three variants of this context. In the first of these, the V of the VC targets of licensing is a full vowel (Kula and Marten 2009). In the second, the V varies between empty and filled in long vowels, but which in LTP, for example, does not call for government but indeed for licensing. The third, final context is where the V is empty. This illustrates the case of Lar licensing inheritance in Polish if the intervening onset is a sonorant, or absorption if the onset is an obstruent. However, the empty nucleus calls for government in LTP and indeed in most varieties of GP including SGP. Either it is governed but still participates in licensing distribution, or one has to consider eliminating internuclear government altogether (see, e.g. Cyran 2010).

All in all, the three structural situations in (18) seem to suggest that both LI and LTP should be revised to include the internuclear licensing relation and its potential absorption by the intervening onset.

### 7. True word-final obstruent clusters ( $C_1C_2\#$ )

In this section we would like to return to the problem of true word-internal and word-final obstruent clusters, which seem to constitute the only configuration in SGP where an internal coda needs to be postulated, thus, retaining the unwanted disjunction of delaryngealization contexts in Polish. The simplest answer to the question of CC agreement with respect to voicing word-finally is that neither member of the cluster is in a position to a-license Lar, because neither of them is directly or indirectly licensed by a vowel. Recall that word-medially, most CC clusters have been shown to be bogus, that is,  $C_1\emptyset C_2V$ . This ensures that  $C_2$  can host laryngeal properties and determines the shape of the entire cluster, because it is a Lar licensing absorber and the empty nucleus does not inherit the Lar licensing properties. As a result,  $C_1$  does not bear its own Lar property and always agrees in voicing with  $C_2$ , e.g.  $/k\emptyset t\sigma/$  and  $/g\emptyset d\downarrow/$ . In the case of some internal and final CCs, a true cluster must be assumed, that is to say, a coda-onset governing relation. This is because it does not break-up when put in absolute word-final context, that is, before FEN, e.g. *mózgu* / *mózg* [muzgu ~ musk] ‘brain,

gen.sg. / nom.sg.’, *szeptu* / *szept* [ʃeptu ~ ʃept] ‘whisper, gen.sg. / nom.sg.’. The existence of true CC clusters in Polish means that we have to refer to two disparate contexts for delaryngealization: before  $\emptyset$ , and in the coda. It is not impossible to claim that Lar licensing in true CC clusters is subject to similar absorption as in bogus clusters, in that the onset (governor) passes on the licensing received from its nucleus to the governee (coda), adding a statement that Lar licensing is absorbed in the same way as in bogus clusters. This would be reminiscent of the steps in Licensing Inheritance (Harris 1997). However, it does not mean that some structural uniformity of delaryngealization contexts should not be sought, especially as recently most varieties of GP steer towards Strict CV, a model in which even the true clusters contain an empty nucleus.

The options of syllabification of true CC clusters depend on the model of GP. In a CVCV version of SGP, which most resembles its predecessor, that is, the Complexity Scales and Licensing (CSL) model (Cyran (2010)), the cluster contains an empty nucleus which is locked (silenced) by an interonset governing relation. Thus, the cluster is still true, but it does contain an empty nucleus. However, being locked, the intervening empty nucleus has been claimed to be phonologically inert. A potential change to this model would have to involve granting this nucleus some licensing properties. Thus, true CC clusters would be claimed to be parallel to true CS clusters discussed earlier in (9b). The consequences of this move need to be looked into. One immediate question would be how to account for the different phonological behavior between such clusters and branching onsets.

In LTP (Scheer 2004, Scheer and Ziková 2010) all clusters that do not stand in a relation of Infrasegmental Government are bogus by definition. No relation is contracted between the onsets. Instead, the empty nucleus is governed either by the following vowel or by the following FEN. Therefore, it is clear that LTP is structurally compatible with the Lar licensing story in that it deems all CC clusters bogus. The problem with current LTP is that the governed  $\emptyset$  is not allowed to be licensed at the same time. It is also not an actor and is unable to pass on any licensing. What is more, even if the empty nucleus were to be granted actorship, it would rather govern its onset because the preceding nucleus is a full vowel, e.g. *mózgu* < /muz $\emptyset$ gu/. Thus, LTP provides the best structural situation in order to capture the lack of distinction between true and bogus CC clusters with respect to Lar licensing in Polish. On the other hand, LTP provides the worst arrangement of the lateral forces to capture the licensing paths established in this paper. In this respect, it seems that not only the current view on syllable structure in general, but also on the arrangement of the lateral forces in Strict CV, is far from satisfactory. Ideally, for Polish, there should be no structural distinction between true and bogus clusters and an arrangement of lateral forces should incorporate the licensing paths illustrated in (11a).

## 7. Absorbers and blockers in Lar domains

Finally, we return to two problems signaled earlier. One concerns the difference between sonorant consonants and vowels, while the other relates to the properties of obstruents that cause Lar licensing absorption. Both issues are to do with some sort of blocking, or its absence. Let us first look at the problem of sonorant specification. Vowels and sonorant consonants are claimed in Element Theory not to possess any laryngeal specification. If so, it is rather unsurprising that sonorant consonants are transparent to Lar spreading (Voicing Assimilation) inside words in Polish, e.g. (*krtań* ‘larynx’, *grdyka* ‘Adam’s apple’).<sup>16</sup> What is surprising is that vowels, which are also not specified for laryngeal properties seem to block

<sup>16</sup> Some opacity is referred to in cases of spreading across word boundaries (e.g. Rubach 1996). Rubach notes the difference between *wiatr zachodni* [v<sup>1</sup>adr zaxɔdɲi] ‘western wind’ in which the lexically voiceless /t/ gets voiced in sandhi across a sonorant, and *kwiat rdestu* [kf<sup>1</sup>at rɛstɯ] ‘knotgrass flower’ in which no spreading of voicing across a sonorant is possible. For a more recent analysis of this opacity see Cyran (2014).

interaction in this respect (*kawa* ‘coffee’, *gafa* ‘blunder’) and allow for disparate specifications in the flanking onsets. This is, of course not a problem for models with full specification of sonorants. All that such models have to do is to order specification of vowels (for voicing) before rules of spreading, while sonorant consonants should receive such specification after spreading.

In privative models, such as ET, the vowel opacity is overlooked. We may propose that the formal difference between vowels and sonorant consonants lies in the function of vowels as Lar licensers. Each vowel is a Lar licenser and therefore it delimits laryngeal domains, not so much by virtue of blocking laryngeal interactions as by the simple fact that it licenses an independent Lar specification on its onset which, as a consequence is immune to external influence. Thus vowels are not to be viewed as blockers in any direct way. Note also that empty nuclei are Lar licensers by virtue of having inherited that property from the following vowel. The thing is, however, that this happens in CØSV where the obstruent is not endangered by any laryngeal property coming from the right-hand context, because no such property is present. On the other hand, in CØCV, the empty nucleus is not a Lar licenser because this licensing property has been absorbed by the following C. In this context, the two obstruents interact because the empty nucleus does not support a separate laryngeal domain.

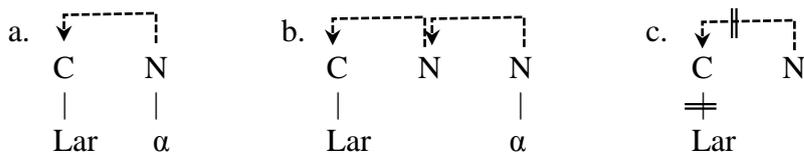
The other problem mentioned earlier concerns the actual property of obstruents that blocks the Lar licensing inheritance. It appears that in binary specification models (e.g. Rubach 1996), the obvious representational aspect of obstruents that makes them candidates for a source of absorption is the laryngeal node or the actual laryngeal specification. We leave aside the problem of later default specification of sonorants in such models. As for privative models like Element Theory, there are at least three choices here. One involves an assumption that what makes obstruents different from sonorants is having a laryngeal node, even though only in one series of obstruents does this node contain a laryngeal category |H| or |L|. Although this view makes a direct connection between Lar licensing absorption and a representational aspect directly related to laryngeal specification, it also assumes that possessing a laryngeal node is what formally distinguishes sonorants from obstruents. Also, the unmarked obstruents would in fact be marked in some way.

An alternative view would be to look at other properties of the representation of obstruents that make them different from sonorants. One possible aspect that may be taken into account is the presence of ‘noise’ |h|, or ‘occlusion’ |ʔ| as sonorants normally do not possess these properties. Recall that reference to a particular property in the subsegmental representation (presence of |H|) has been proposed for Breton vowel length distribution discussed above. Yet another way of looking at the distinction between sonorants and obstruents is to refer to subsegmental complexity, as in Zdziebko (2012). Obstruents are bound to be more complex than sonorants. We will leave the issue unresolved, pointing to the fact that at least three options are available. The question is to what extent a particular proposal will express a direct link between Lar licensing absorption and a particular representational property, and how it fits the overall theoretical view on representations.

## 8. Conclusion

Only full vowels can license Lar distinctions in Polish. Empty nuclei may inherit that property from a following vowel if it is not absorbed by an intervening onset. The licensing paths for Lar licensing in Polish are given below in (19).

(19) *Laryngeal licensing* *delaryngealization*



Thus, Lar licensing is an inherent as well as inherited property of nuclei. The distribution of laryngeal contrasts in Polish is not very complicated, but providing a uniform formal definition of the contexts hosting this distinction and those in which obstruents are subject to delaryngealization requires that two very important representational conditions to do with word structure be met. Firstly, if a uniform context of the following  $\emptyset$  is responsible for Lar loss, then the distinction between true and bogus clusters should be irrelevant to the Lar licensing paths. Secondly, the latter have to be redefined to allow empty nuclei to inherit properties, as well as to pass them on. Additionally, a competition between targets of licensing needs to be recognized (e.g. Fortuna 2015). Even though some work within Strict CV points to VC as a double target of licensing, it is not a dominant view in this family of phonological models.

We conclude that, while neither LTP nor LI theories of neutralization seem to express the licensing paths discussed in this paper, some aspects of both theories, if supplemented by the proposals with VC targets of licensing may form a platform for new proposals within Strict CV that would cover all the aspects discussed in this paper.

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