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PROSTHETIC CONSONANTS  
AND THE QUESTION OF NUCLEAR IMPACT.  
EXAMPLES FROM SLAVIC LANGUAGES

**Abstract.** The article focuses on the problem of consonant prosthesis in a number of Slavic languages with a view to establishing both the context and trigger of the process. The phenomenon is analyzed from the perspective of *Government Phonology* (Kaye, Lowenstamm, and Vergnaud 1985,<sup>1</sup> 1990; Charette 1991; Harris 1994; Gussmann 2007; Cyran 2003; Bloch-Rozmej 2008) which advocates a hierarchical model of phonological structure. The evidence examined here comes from Polish, Sorbian, Russian, Czech, Ukrainian and Belorussian. In all these languages consonant prosthesis is realized in the onset of the word-initial syllable. Thus, we also discuss the problem of the initial syllable prominence and the significance of a licensing relation that binds the members of the initial CV domain. It is proposed that the nucleus which determines the identity of the onset licensee is directly responsible for the excrescence of a prosthetic consonant, both prosodically and melodically. Hence, in order to fully understand the nature of the development, the analysis of the vowels involved in the process in terms of their segmental structure is needed. It will be demonstrated that the elements which build vocalic segments extend their domain of interpretation to affect the positions preceding them in the structure of the word-initial syllables. The problem of consonant prosthesis will be examined as an instantiation of the cross-linguistic tendency to strengthen segments in word-initial contexts.

**Key words:** consonant prosthesis; Slavic languages; syllable prominence; licensing; elements; nucleus.

1. INTRODUCTION

The phenomenon of prosthesis consists in the appearance of a segment in the word-initial position without modifying the meaning of the lexical item. Also, the basic structure of the domain remains unchanged. The prosthetic

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<sup>1</sup> Henceforth KLV.

segment can be either a vowel or a consonant. In the discussion to follow we shall focus on the development of prosthetic consonants in some Slavic languages where their evolution from Proto-Slavic changed words by adding prosthetic consonants in the word-initial position, e.g.: Russian *okno* ‘window’ is realized in Ukrainian as *vikno* and in Belarusian as *vakno*. In present-day Polish, cross-dialectal studies also reveal the occurrence of [w] and [j] at the beginning of words in some varieties which are absent from the standard realizations of these items. The process will be examined through the optic of Government Phonology which defines a phonological domain as a sequence of onsets and nuclei organizing consonantal and vocalic segments respectively. Significantly, each domain opens with an ON cluster which constitutes the site where the process of prosthesis takes place. Thus, it will be demonstrated how the specific nature of this context contributes to the emergence of prosthetic consonants.

## 2. BASIC FACTS<sup>2</sup>

As observed by Dalewska-Greń (2002), the phenomenon of consonant prosthesis seems to be connected with distributional limitations imposed on particular vocalic segments. In Polish, for instance, [ɪ] is never found in the word-initial position. In East Slavonic languages, the distribution of certain vowels depends on whether a given word-position is accented or not. What is interesting in some languages such as Sorbian and Belorussian word-initial vowels enforce the creation of the so-called prosthetic consonants in the preceding onset. In Upper Sorbian the vowels [i̯], [ē̯] and [ō̯] are never attested at the beginning of words, whereas [i, e, o, u] can be found only in borrowings. [o] and [u] also have the capacity to develop a prosthetic [ɥ] (spelt as *w*) in the onset to the left (Dalewska-Greń 2002: 53).

(53)	<i>Polish</i>	<i>Sorbian</i>	
	obdarować	wobdarjować	‘to reward’
	obeschnąć	wobeschnyć	‘get dry’
	on	wón	‘he’
	orać	worać	‘plough’
	uczyć	wučić	‘teach’
	ucho	wucho	‘ear’

<sup>2</sup> This section is based on the evidence discussed in Dalewska-Greń (2002).

Lower Sorbian seems to be no different from its Upper variety as testified by such lexical items as *woko* ‘eye’, *wucho* ‘ear’ or *wogęń* ‘fire’. The prosthetic [w, v, ɥ] are attested also in other West Slavonic languages, in their non-standard, dialectal varieties, as in *yoćec* ‘father’ (Polish) or *woko* ‘eye’ (Czech) (Stieber 1979: 61). In fact, the present-day Polish [v] that occurs before the back nasal vowel [õ] is the result of the prosthesis process that took place in the history of Polish. Several examples depicting this development are given in (2).

- (2) w[v]ąsy ‘moustache’  
 w[v]ęgiel ‘coal’  
 w[v]ąż ‘snake’  
 w[v]ątroba ‘liver’

In other Slavic languages such as Russian or Croatian a similar development can be observed, though it is very limited as demonstrated by *yc* ‘moustache’, *ymroba* ‘liver’ (Russian), *utroba* (Croatian). Russian has only several words in which the prosthetic [v] is created, e.g. *восемь* ‘eight’ (PGRUM 1978: 91–92). In Standard Ukrainian, the prosthetic consonants are found before [u] and [i] (<[o]), though more seldom before [o], as in

- (3) *вугіль* ‘coal’  
*вуж* ‘snake’  
*вухо* ‘ear’  
*вуста* ‘eight’

As pointed out in Czekman and Smułkowa (1988: 222), accented vowels of Belorussian, i.e. [o, u, e, i] induce the creation of the prosthetic consonant at the beginning of words, which makes the language different from Russian. Dalewska-Greń (2002: 55) illustrates this difference with the following examples.

- (4) *Belorussian*      *Russian*  
*вобад*              *обад*              ‘dinner’  
*вобраз*             *образ*             ‘painting’  
*вуж*                 *уж*                 ‘snake’  
*воблака*            *облако*            ‘cloud’

It is noteworthy that the back vowels develop [v] in the context of prosthesis, whereas the front [e] creates the laryngeal [h] and [i] is preceded by [i] in accented syllables. Consider the words in (5) below.

- (5) *іграны* [j'ihran i] 'you play'  
*іскра* [j'iskra] 'spark'

It has to be added that the problem of stress placement plays a significant role in the process of consonant prosthesis. In Belorussian at least, the shift of stress disables the vowels from developing the prosthetic consonant. Further, such a segment will be created even if it is not the word-initial syllable that is stressed. The latter phenomenon is illustrated in (6), the former in (7) below.

- (6) *Non-initial stress*  
*маіх* [maj'ix] 'my/gen.pl'  
*тваіх* [tvaj'ix] 'your/gen.pl'

- (7)<sup>3</sup> *Prosthetic consonants in stressed versus unstressed contexts*

[j'ihrany] vs. [ihr'ac'] 'play'  
 [j'iskra] vs. [iskr'ycca] 'spark/sparkle'  
 [v'okny] vs. [akn'o] 'in the window/window'

In the Sorbian varieties, a prosthetic laryngeal [h] can be found in such words as

- (8) *Hadam* 'Adam'  
*hyś* 'to go'  
*Handroš* 'Andrew'

Let us now sum up the basic facts concerning the process of prosthesis in the Slavonic languages. What seems significant is the fact that the process is induced by vowels, [i] [u] and [o] in particular. Secondly, the vowels responsible for the prosthesis need to be stressed. The development takes place in the word-initial syllable. The outcome of the prosthesis process are [j], [w/ ɥ] or [v/v].

In what follows a brief outline of the *Government Phonology* approach to domain structure will be delineated. We shall focus on the significance of the Onset-Nucleus bond which can be directly responsible for the processes that occur in this context, including consonant prosthesis. We shall also attempt at determining the mechanism that underlines the creation of the seg-

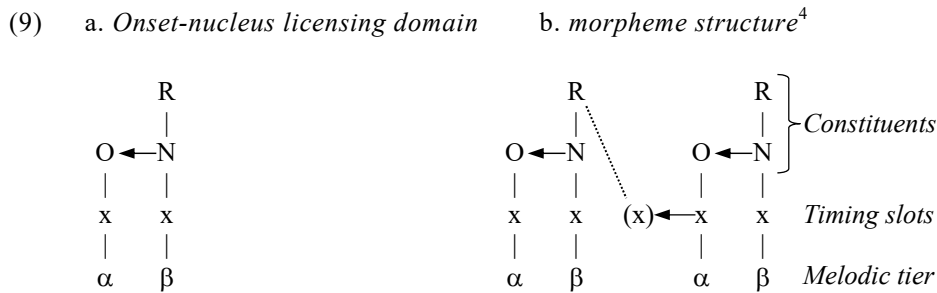
<sup>3</sup> The transcription comes from Dalewska-Greń (2002, 56).

ment in the word-initial position. This aim requires that a closer look be taken at the internal structure of segments as defined by the framework adopted in this study.

### 3. DOMAIN STRUCTURE

#### 3.1. ONSET-NUCLEUS DOMAINS

What distinguishes Government Phonology from other non-linear models is its approach to the internal organization of phonological domains. In the discussion to follow we shall focus on the most uncontroversial traits of the model which currently possesses various offshoots such as the *CVCV Phonology* or *Government Phonology 2.0*. The framework proposes that each phonological domain is structured as a sequence of onsets and rhymes which, in turn, are headed by nuclei. Thus, the theory recognizes the existence of three basic phonological constituents—Onset, Nucleus and Rhyme. The structure is hierarchical in the sense that three major tiers are recognized: melodic, skeletal and constituent. The levels are synchronized by means of association lines. The graph in (9b) illustrates this situation.



As depicted above, each phonological domain begins with an onset point and finishes with a nuclear constituent. The core of the structure is the timing or skeletal tier where the basic relations of dominance are contacted. Segments are organized within the melodic plane and can acquire phonetic realization once attached to the relevant skeletal positions. The syllabic con-

<sup>4</sup> Rhyme can also dominate the so-called rhyml complement point whose occurrence depends on the onset to its right. Traditionally, such units were analyzed as codas.

stituents are created in terms of the licensing/governing<sup>5</sup> relations established locally between the skeletal points. The arrows included in the structure in (9) stand for such relations. The relation that is of crucial importance for the present discussion is one depicted in (9a). In particular, it is assumed that an onset and the following nucleus constitute a licensing domain where the dominant position is granted to the latter. In fact, the nucleus sanctions, or licenses, the existence of its onset in the structure. In other words, the identity of the onset consonant crucially depends on the licence it receives from the nuclear position to its right. The O-N dependence is both prosodic and melodic and has a universal character. The *Onset Licensing Principle* (KLV 1985) proposed by the theory clearly captures this universal requirement. We shall abstain from going into a more detailed elaboration of the theory and limit ourselves to only the necessary information that directly pertains to the analysis of the problem under study.<sup>6</sup>

As indicated above, in our analysis of the prosthesis process we have to focus on the Onset-Nucleus licensing domain as this is the site where the phenomenon occurs. Within such domains, the prosodic dominance of the nucleus manifests itself as sanctioning the presence of the onset point in the representation. The melodic identity of the onset segment, in turn, depends on the amount of licensing potential it is granted by its right-hand licensor. This can mean, first of all, allowing the consonantal segment present in the melodic plane beneath the onset position to attach to this point and thus become phonetically interpretable. Secondly, the dominant role of the nucleus can also manifest itself as its influence on the phonetic realization of the preceding consonant in the form of, for instance, imposing some of its own phonetic properties on the left-hand consonant. An example of such an impact can be a palatalizing effect that high front vowels exert on the preceding consonants in Polish or Irish.

### 3.2. EMPTY SLOTS

The idea of empty positions that can be present in the phonological representation, first proposed in Anderson (1982), has also been incorporated into the theory of *Government Phonology*. This assumption finds support in the

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<sup>5</sup> Government is a more stringent form of relation.

<sup>6</sup> For a detailed discussion of the theoretical assumptions of the classical model of Government Phonology, see KLV (1985, 1990), Harris (1990, 1994), Charette (1991), Bloch-Rozmej (2008), Cyran (2003) among others.

presence of vowel-zero alternations exhibited by many world's languages, epenthetic segments, linking consonants as in English, to mention just a few phenomena. It needs to be noted that both nuclei and onsets can be empty, i.e. unattached lexically to any melodic material. What is more, GP proposes that in vowel-initial words, their domains begin with empty onset positions, whereas in consonant-final items, the last unit in the structure is an empty nucleus. However, the occurrence of empty positions cannot be unrestricted. Their presence is regulated by the operation of the *Empty Category Principle* which requires that each empty slot be either properly governed or parametrically licensed.<sup>7</sup>

Though available in the phonetic structure, empty positions have a depleted licensing potential. More precisely, this capacity of empty positions seems to be a language-specific property. Some systems may 'prefer' to have them filled with melodic content, while others can tolerate their emptiness. Some may allow empty positions to perform more extensive licensing responsibilities, while others perceive them as more restricted in this respect. What seems to be a more or less universal tendency, though, is disallowing sequences of empty positions in the structure. Such empty ON pairs tend to be eliminated, or reduced.

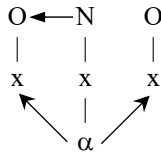
As for the licensing capacity of empty positions, it is noteworthy that a nucleus, even when deprived of its melodic content, still remains a legitimate licenser of the preceding onset. However, neither an empty nucleus nor an empty onset can be governors for other nuclei or onsets respectively. They may only be governed.

### 3.3. EXTENSION DOMAINS

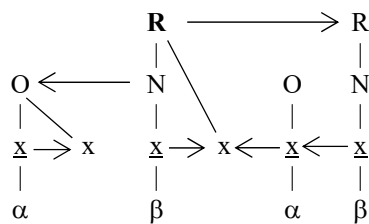
As argued in Bloch-Rozmej (2008), the impact of nuclei upon onset positions can extend both leftwards and rightwards from the nuclear slot. To the left of their locus, nuclei perform the function of both prosodic and auto-segmental licensers but their influence can also reach the onsets that follow. In (10) we depict the bi-directional nature of nuclear impact.

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<sup>7</sup> Proper government is a stronger form of government which requires that an empty position, in order to remain empty, be sanctioned by a phonetically expressed position which itself is not governed. GP also assumes that final empty nuclei are universally licensed as required by the *Final Empty Nucleus Parameter*.

(10) *Range of nuclear impact*

The mechanism illustrated in the diagram is that of extension. Thus, the nucleus can extend both leftwards and rightwards, exerting influence on the onset segments that surround it. The amount of the extension potential that nuclear positions are endowed with will obviously depend on the place of a given position within a phonological domain. Consequently, stressed nuclei will enjoy the greatest extension potential. Such nuclei are also the ultimate source of all the autosegmental licensing potential available in the whole domain. The diagram in (11) demonstrates the path of distribution of the autosegmental licensing potential within a phonological domain. The head of the domain does not have to be licensed by any other position in order to execute element extension. All the remaining nuclei in a given domain will receive authorization to extend elemental material rightwards from their licensors.<sup>8</sup>

(11) *Distribution of the  $\alpha$ -licensing potential within a phonological domain*

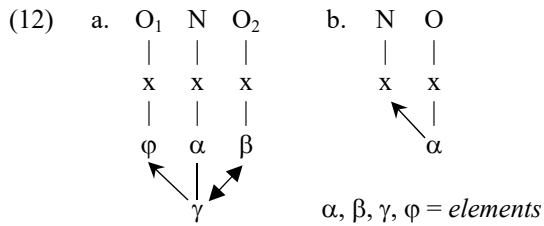
*R is the head of the domain*

What is significant in the context of element extension is the ability of the nucleus to both license the onset elements under the onset point but also have access to them. This access can manifest itself as the contribution of the onset-dominated elements to the phonetic interpretation of both the onset

<sup>8</sup> The theory of GP assumes that elements are the primitive units of melodic structure. They have unique phonetic interpretations and can amalgamate to build more complex segmental structures.



consonant and the vowel. The potential forms of element extension are depicted in (12).



In the configuration schematized in (12a) a nuclear prime  $\gamma$  extends its domain of interpretation either rightwards or leftwards and affects the neighboring onset positions. The rightward element extension can be exemplified by the so-called backness sharing taking place in German e.g. in *Dach* [dax] ‘roof, sg.’. Here, the vowel [a] spreads its [+ back] property onto the onset consonant to its right. Polish, in turn, supplies examples of leftward extension where high front vowels can palatalize preceding onset segments, as in *kot//koci* [kot]/[kotei] ‘cat/gen.sg.’.<sup>9</sup> As can be seen, nuclei are free to extend both leftwards and rightwards, depending on the system. The elements specified under the onset points appear to be more restricted in this respect. As depicted in (12b), an element lexically specified in the onset extends leftwards to the empty nuclear position. This operation is definitely more surprising since no licensing relation binds the onset and the preceding nuclear position. Still, it is possible to find instances of such an onset-nucleus interplay in some languages, e.g. in the occurrence of the so-called syllabic consonants Yet, from the point of view of the present discussion, the relation schematized in (12a) will be of greater significance.

#### 3.4. ELEMENTS AND SEGMENTAL IDENTITY

Before we proceed to the analysis of the prosthesis process, a few remarks on the structure of segments are needed. *Government Phonology* views segments as elemental composites. Elements themselves are cognitive entities, each having its unique articulatory and acoustic correlates. Hence, elements are autonomous, whereas segments can consist of one or more

<sup>9</sup> Palatalization in Polish constitutes a lot more complex phenomenon than this simple observation might suggest. For an in-depth study of this issue within GP, see Gussmann (2007).

phonological primes of which each contributes to some extent to the ultimate phonetic interpretation of the compound. In case more than one element is involved in the segmental structure, the primes enjoy different status. One of them can be granted head status, thus having the biggest impact on the phonetic manifestation of the melody. The autonomy of elements should be understood as, among others, the ability to spread to other positions without ‘dragging along’ any other primes contained in a given segment.

There are three typically vocalic elements recognized by classical GP – **I**, **U** and **A**.

(13) <i>Element</i>	<i>Property</i>
<b>I</b>	high, palatal
<b>U</b>	back, round, labial
<b>A</b>	low, open, coronal

Thus, we can see that the vocalic elements also have the potential to define consonantal segments. Precisely, they are used to represent primarily the place of articulation of consonants. The element that has been skipped from the table in (13) is the so-called neutral element **@** which, in the previous versions of the model, was used to represent velar or lax specifications of the segment. Currently, velar consonants are represented as having no active prime in the head position. Likewise, lax vowels are structured as empty-headed. In (14) below elemental make-ups of the vowels [i, i̇, e, o, u, a] are presented as these will be considered in the subsequent sections of the paper.

(14)	[i]	[i̇]	[u]	[o]	[e]	[a]
	x	x	x	x	x	x
	I	–	U	U	I	A
		I		A	A	

We have indicated head status only in the representation of [i̇] since this property makes the vowel distinct from [i] in the systems where both these vowels occur. In the remaining cases the head-operator/dependent status of the elements has to be decided individually for specific systems.

Having outlined the major traits of the theoretical model of *Government Phonology* which directly pertain to the analysis of prosthesis, let us return to the Slavic data. In the forthcoming discussion, an attempt will be made at determining the phonological context, trigger and mechanism of consonant prosthesis.

#### 4. THE ANALYSIS

##### 4.1. THE SPECIFICITY OF THE WORD-INITIAL CONTEXT

As revealed by the evidence on consonant prosthesis in Slavic languages, the process is mainly attested at the left edge of the word. The development consists in the creation of either [j], [w/ɰ] or [v/ʋ] (and sometimes [h]) before the relevant vowels. The facts mentioned in Section 2 might then indicate that the word-initial position is in some ways a special context. Hence, in the present section a few observations concerning the specific character of this position will be presented.

As observed in Barnes (2003, 2), the word-initial position features as prominent in many respects. Above all, ‘the propensity for initial syllables to function as strong licensers of contrast is widely acknowledged.’ Segmental material lodged in this context plays a crucial role in lexical retrieval and processing. Hence, cross-linguistically, initial consonants realize more contrasts than in other contexts within words. Still, it needs to be underlined that the very concept of the *initial position* is not uncontroversial and can be conceived of as either root initial, as in Beckman (1998), or as a beginning of the morphological word, as in Smith (2002). It is further argued that word-initial positions are prominent mainly psycholinguistically because they favor the realization of all contrasts. This, in turn, enables better lexical access.

Phonetics wise, domain-initial consonants often undergo strengthening (Cho and Jun 2000; Byrd 2000; Dilley, Shattuck-Hufnagel, and Ostendorf 1996 among others). Both laryngeal and supralaryngeal gestures of segments become increased in terms of magnitude and duration at the beginning of prosodic domains. For example, research indicates that initial consonants can be strengthened in English and French (Byrd 2000; Fougeron and Keating 1996; Turk and Shattuck-Hufnagel 2000). Further, word-initial consonants are often involved in neutralization processes which reduce their

sonority. Smith (2002) provides examples of Mongolian, Mbabaram, and Campidanian Sardinian as systems which require low-sonority onsets. In Arapaho and Guhang Ifugao an even more stringent requirement is imposed on domain structure as the languages ban onsetless syllables at the beginning of words. The author also suggests that the realization of an initial glottal stop in words beginning with vowels perfectly illustrates this tendency.

#### 4.2. THE CONTEXT AS A TRIGGER

Let us now try to summarize the facts concerning the contexts for consonant prosthesis in the Slavic languages exemplified in Section 2.

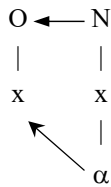
(15)	<i>Language</i>	<i>Prosthetic Consonants (PC)</i>	<i>Following vowel</i>
	Sorbian (Upper & Lower)	w/ɥ	o, u
		h	a
	Polish (Standard)	v/v	õ, ẽ
	Polish dialects	w/ɥ	o
	Czech	w/ɥ	o
	Russian	w/ɥ	u
		v /v (rarely)	o
	Ukrainian	v/v	u, o (rarely)
	Belorussian	v/v	o, u (when stressed)
		j	i
		h	a

The context for the prosthesis to take place is that of the word-initial onset which becomes realized as either a glide, fricative [v] or a laryngeal [h], depending on the kind of vowel that follows. What seems of great importance is also stress placement. Namely, the syllables where the phenomenon occurs need to be stressed. A shift of stress, as can be observed in Belorussian, leads to the absence of the change.

The theory of *Government Phonology* underlines the fundamental role of the context in triggering phonological processes. It is maintained that phenomena take place whenever the context for their occurrence arises. Thus, all the factors responsible for the appearance of a given change need to be directly identifiable in the context. The phonological representation is the ultimate source of all phonological operations.

When analyzing the change within the model of *Government Phonology*, it has to be observed that the development takes place in the domain constituted by a word-initial onset and the following nucleus. The relation that binds these positions is that of licensing, which is in accordance with the universal *Onset Licensing Principle*. The nucleus performs the function of the licenser, thus sanctioning both the prosodic role of the non-nuclear point and its potential phonetic interpretability. Recall that the licenser is the source of the autosegmental licensing potential for its licensee.<sup>10</sup> The domain has been depicted in (16).

(16) *ON structure*



It is noteworthy that the relation of licensing enables the occurrence of various forms of vowel-consonant interaction. Suffice it to mention such operations as element sharing or element spreading attested in a wide range of languages (e.g. Connemara Irish). It also has to be added that the interplay between C and V can in fact be mutual, as in some systems it is the vowel that influences the preceding consonant, while in others, the impact is exerted rightwards from the onset segment (e.g. the influence of palatalized consonants on following vowels in Polish, as argued in Gussmann 2007). Recall that we have captured the bi-directional nature of the CV interplay in the concept of element extension.

In the light of what has been established about the process of consonant prosthesis so far, we propose that the direction of element extension is leftward, going from the vocalic licenser to the onset licensee. Further, the operation consists in the sharing of the vocalic element with the preceding onset position, whereby the prime contributes to the manifestation of both the vowel and the consonant. Since in the process of prosthesis it is the segmental material of the vowel that determines the identity of the preceding consonant, let us look into the internal structure of these segments. We repeat them in (17) below.

<sup>10</sup> This requirement is imposed by the *Licensing Inheritance Principle* (Harris 1994).

(17)	[i]		[u]	[o]	[e]	[a]
	x		x	x	x	x
	I		U	U	I	A
			A	A		

When we consider the internal representations of the vowels inducing consonant prosthesis, we easily discern that in the majority of cases, the elements that can be regarded as triggers of the change are part of the vocalic make-ups. More specifically, the prosthetic segment arising before [i] is [j]. In the model of segmental structure proposed by GP, both the vowel and the palatal glide are defined by the same prime **I** attached to the nuclear and onset points respectively. The same holds for the excrescence of the back glide [w/ɥ] before rounded vowels which contain the element **U**.

(18)	<i>Vowel</i>	<i>Glide</i>	<i>Vowel</i>	<i>Glide</i>
	N	O	N	O
	x	x	x	x
	I	I	U	U
	[i]	[j]	[u]	[w/ɥ]

Thus, the same melodic material can receive different phonetic interpretations depending on its prosodic association. Let us now see how the process of prosthesis is effected in the ON licensing domains.

(19)	O ← N
	x     x
	↙     I/U

The licensing relation holding between the nuclear head and the onset complement enables the spreading/sharing of the prime lexically attached to the nuclear position to the non-nuclear point to its left. In consequence, the element distinctively specified in the vowel extends its interpretation over

the whole licensing domain, the results being either [ji..] or [wu..]. At this point it needs to be clarified that element spreading is defined as a purely interpretive operation, and not as any ‘movement’ of the prime from one site to another (Harris 1994). In this way we can easily account for the creation of glides before [i] as well as before [u] and [o] since the vowels contain the elements which define the glides [j] and [w] respectively. More precisely, the former calls for the availability of **I**, whereas the latter requires the presence of the element **U**.

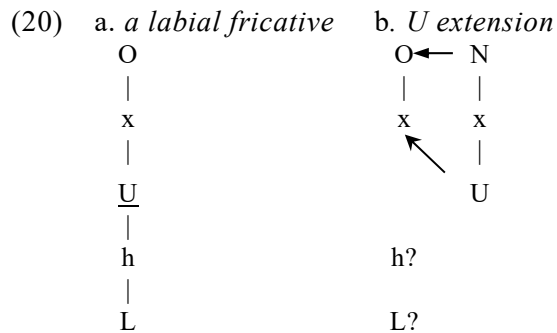
At this point we need to address another important question that arises with reference to element spreading. Namely, languages differ in terms of the conditions that have to be satisfied in order for spreading to be effected. One such condition pertains to the status of the spreading prime. To be more precise, some systems allow element spreading only from head position, while others may tolerate such an operation also when the spreading prime is an operator. We shall hypothesize that in the case of prosthesis, the spreading involves the element that enjoys head status in the vowel. In other words, elements spread from the head position. This statement appears to be especially true for Polish where two high front vowels can be found – [i] and [i̥]. The former is defined by the element **I** residing in the head position of the segment and the latter by the same prime having the operator status. Of the two vowels, however, only the former induces the prosthesis. Recall that no words in Polish begin with [i̥].<sup>11</sup>

An interesting situation arises before the vowel [a]. Notice that the prosthetic consonant occurring before this vowel is the glottal [h]. The difficulty consists in the problem of representing this sound in different languages. Some systems use the element of noise **h** which is responsible for coding friction. However, vowels are by nature frictionless and [a] cannot be defined by this element. At this stage it seems to be useful to recall some of the arguments in favor acknowledging the special status of the word-initial context discussed in the previous section. As proposed by Barnes (2003), this site is likely to host segment strengthening phenomena, especially ones intensifying the laryngeal gestures of consonants. Notice that [h] is a laryngeal sound. Therefore, we want to stipulate that the element **A** which in Polish is not allowed to spread, but which occurs in the head position of the

<sup>11</sup> Of course, except for the prosthetic [v] that arose in the history of Polish, the standard variety does not have any active process of consonant prosthesis. By Polish here we understand some Polish dialects, e.g. Kurp. The remarks concerning the two high front vowels, however, pertain to Standard Polish.

vowel, shares its headedness with the preceding onset point.<sup>12</sup> Further, a headed primeless onset will be interpreted phonetically as a glottal [h]. Beyond doubt, more research needs to be done in order to verify this stipulation.

When considering the data on consonant prosthesis, we can observe that in Ukrainian and Belorussian, the outcome of the process is not the glide [w] but a fricative [v]. In the classical model of GP, fricative consonants are defined by the element of noise which combines with an element encoding the place of articulation and that of the laryngeal property **L** (voicing or voicelessness). The representation of [v] will thus be as follows.



It is noteworthy that any excrescence of a segment in the phonological representation should have a local source. Hence, we would expect that the elements of noise and **L** should be present in the immediate neighborhood of the initial onset. Since it is the vowel that follows this site and vowels are spontaneously voiced as well as deprived of any friction, there seems to be no local source for such elements in the prosthetic consonant. It has to be added, however, that the status of headedness can receive different interpretations in different languages. As has been demonstrated in Bloch-Rozmej (2008) and Cyran (2003), headedness can manifest itself as either voicing (e.g. in German) or noise (Munster Irish). Thus, on the face of what has been said so far, we will hypothesize that the extension of the headed **U** from the following nucleus can in Belorussian and Ukrainian receive language-specific interpretation as [v]. This would probably mean that headedness will be interpreted as friction in these systems. As was the case with the prosthetic [h] in Sorbian or Polish, such a proposal requires further research.

<sup>12</sup> For a special role of segmental headedness and its capacity to define language-specific phonetic effects, see Bloch-Rozmej (2008).



In what follows, we are going to turn to the realization of the prosthetic [v] that took place in the history of Polish in the context of a following nasal vowel.

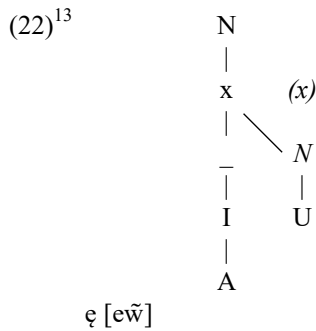
#### 4.3. NASAL VOWELS AND CONSONANT PROTHESIS

As was indicated in the previous sections, at a certain stage in its history, Polish developed a prosthetic consonant [v] before the so-called nasal vowels. The actual phonological status of such vocalic expressions is still subject to controversy in phonological research. Some linguists treat them as independent phonological units (e.g. Doroszewski 1963 or Laskowski 1975), whereas others regard as sequences of vowels plus nasal segments (e.g. Biedrzycki 1996; Gussmann 1974 and 1980; or Rubach 1984). Since it is not the aim of the present discussion to settle this argument, we shall focus only on their realizations after [v] and adopt their representation as nasalized diphthongs [eṽ] and [oṽ]. In (21) below some illustrative examples where the prosthetic [v] was added are provided.

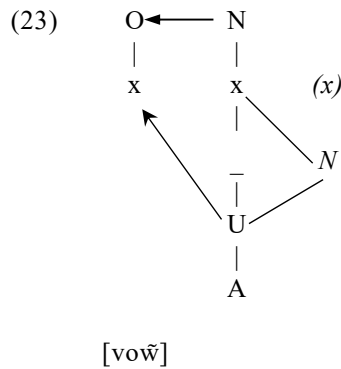
- (21) wąż        ‘snake’  
       wątroba ‘liver’  
       węch     ‘smell’  
       wąsy     ‘moustache’  
       węzeł    ‘knot’

At this point it has to be stressed that Polish tolerates vowel-initial words. However, the nasal vowels are barred from occurring in this context, in which they are similar to the vowel [i̯]. Apparently, the restricted distribution of [i̯] and the nasal vowels cannot be accidental. Notice that [i̯] can be found at the beginning of words, e.g. in *igła* ‘needle,’ *iskra* ‘spark,’ *ile* ‘how many.’ *Government Phonology* expresses the difference between [i̯] and [i] by treating [i] as a headed melodic structure and [i̯] as non-headed. Polish seems not to allow sequences of two empty-headed positions domain-initially (i.e. when the onset is empty and the following nucleus is either empty or empty-headed). This might be connected with the prominence of the word-initial CV domain. Hence, an empty onset position seems to call for some support of a segmentally complex headed nucleus, i.e. a stronger licensor. Thus we can argue that Polish disfavours sequences of an empty onset and an empty-headed nucleus to the same extent as those of two empty

positions. We would like to argue, therefore, that the non-occurrence of nasal vowels in the word-initial position is due to their being empty-headed, as depicted in (22).



Synchronically, the nasal vowels have to occur after an onset dominating some segmental material. On the face of that, it comes as no surprise that the prosthetic consonant was created before these vocalic expressions. The process of prosthesis can be regarded as a kind of repair strategy allowing a given form to escape violation of the abovementioned Polish-specific restriction. More specifically, the [eĩ] and [oĩ] shared their U prime (defining the [w] portion of the vowel) with the preceding empty onset position.



Thus, it can be maintained that consonant prosthesis occurring before the nasal vowels in Polish helps the lexical items satisfy the well-formedness conditions on the structure of phonological domains and makes them licit.

<sup>13</sup> A similar structure was proposed in Bloch-Rozmej (1997).

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## 5. CONCLUSION

In this article, the problem of prosthetic consonants in a number of Slavic languages has been discussed. We defined the context in which the process takes place and tried to identify the trigger of the development. Based on the available literature on this question we adopted the initial syllable prominence approach. In accordance with this hypothesis, this is a site where the majority of segmental contrasts are realized. In many languages it is also the carrier of the word's stress. The word-initial CV is also significant psycholinguistically. It is only expected, therefore, that consonants appearing in this position frequently undergo strengthening processes. In some sense, the excrescence of prosthetic consonants can be viewed as a manifestation of such strengthening. It was pointed out that the change results in the creation of [j, w, v, h] in the word-initial onset before the relevant vowels. More precisely, [j] occurs before [i], [w] before [u] and [o], [h] before [a], whereas [v] precedes the nasal vowels, [u] and [o]. It is noteworthy that the identity of the prosthetic consonant is tightly connected with the internal melodic make-up of the following vowel. Precisely, in the creation of a consonant characterised as 'labial,' the vocalic expression contains the element **U** which encodes roundness and labiality, while the occurrence of [j] requires the presence of the element **I** in the vowel that follows. Further, the excrescence of the laryngeal [h] before [a] is strictly dependent on the language-specific approach to the status of segment's headedness. Its creation was claimed to derive from headedness sharing between the vowel and the preceding onset. It also has to be added that any operation that involves a nucleus and the word-initial onset has to be effected under the relation of licensing. *Government Phonology* proposes that licensing is the major driving force of all phonological events occurring within a phonological domain. It comes as no surprise, therefore, that the identity of the onset segment always depends on its nuclear licenser. The nucleus, as put forward in this study, has the capacity to extend its melodic material both leftwards and rightwards to affect either the preceding or following onset consonants. In the process of consonant prosthesis, leftward element extension is activated.

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#### PROTEZY SPÓŁGŁOSKOWE W JĘZYKACH SŁOWIAŃSKICH A WPŁYW POZYCJI OŚRODKA SYLABY

##### Streszczenie

Celem artykułu jest analiza zjawiska protez spółgłoskowych w wybranych językach słowiańskich. Zostaje podjęta próba ustalenia kontekstu, w jakim zachodzi ten proces oraz jego przyczyn. Dyskusja prowadzona jest w ramach modelu Fonologii Rządu, który zakłada istnienie ścisłego związku między wystąpieniem danego zjawiska a pozycją w strukturze fonologicznej. Dane językowe zostały zaczerpnięte z języka polskiego, łużyckiego, rosyjskiego, czeskiego, ukraińskiego i białoruskiego. Analiza opiera się na założeniu, że pierwsza sylaba wyrazu pełni szczególną rolę w reprezentacji fonologicznej. Autorka dowodzi, że tożsamość spółgłoski protetycznej zależy od natury następującej po niej samogłoski, np. występowanie [w] warunkowane jest obecnością samogłoski zaokrąglonej. Ponadto istotną rolę w procesie tworzenia protez spółgłoskowych odgrywa element będący członem głównym segmentu.

**Słowa kluczowe:** protezy spółgłoskowe; języki słowiańskie; sylaby nadrzędne; licencjonowanie; elementy; ośrodek sylaby.