NASAL VOWELS IN POLISH

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The aim of the following discussion is to analyse the problem of nasal vowels in Polish in the light of phonological licensing and language-specific parameter settings. We shall attempt to provide their phonological representation and explore their role in the phonological system of Polish. The basic question at stake here is whether nasal vowels actually exist as independent nuclear units in Polish or whether they should be viewed as sequences of oral vowels plus nasal segments. Let us start the discussion by presenting the major assumptions of Government Phonology which will be of immediate interest to our analysis.

1. *An overview of Government Phonology*

The theory of government first proposed by Kaye, Lowenstamm, and Vergnaud (1985,1990) assumes that phonological phenomena stem directly from a series of principles and parameters. Central to the theory is the notion of government which is a binary asymmetrical relation holding between two skeletal positions – the governor and the governee. Being a form of licensing it is viewed as the ultimate source of phonological events. Charette (1991:11) argues that the lexical representation of a word consists of a linear sequence of segments at the melodic level, a linear sequence of skeletal points at the skeletal level and a linear sequence of onset – rhyme constituents at the constituent level. Nuclear points with their vocalic segments are lexically associated with a constituent nucleus. The skeletal points along with their segments are projected onto constituents in terms of governing relations they contract with each other.

A governing relation between two skeletal positions is possible only when the following conditions are satisfied:

(1) a. *The Strict Adjacency Condition*
The governor must be adjacent to the governee at the P0 projection, i.e. the projection containing every skeletal point.

b. *The Strict Directionality Condition*
Directionality of government at the skeletal level is universal and not subject to parametric variation:
i. Constituent government is head-initial.
ii. Interconstituent government is head-final.

The formal conditions cited above combine with the substantive requirements determining to what segmental material the governee and the governor may be linked. The Complexity Condition proposed by Harris (1990:274) imposes the following constraint on government:

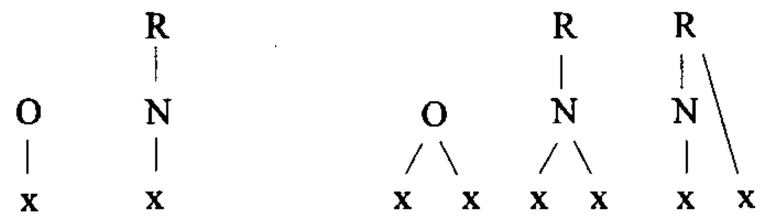
(2) *Complexity Condition* (Harris (1990:274))
Let α and β be segments occupying the positions A and B respectively. Then, if A governs B, β must be no more complex than α.

Thus, the segment linked to the governing position may not be composed of fewer elements than that associated with the governed skeletal point.

The theory proposes that each segment may be composed of a number of elements which are fully specified at all stages of derivation.[1] Elements may combine to produce complex segments. Such a fusion operation involves two elements: one defined as the head, the other as the operator. Within Government Phonology three types of non-arbitrary operations are permitted: composition, decomposition and the reorganisation of the head-operator relation. Traditionally, the first two processes would be described as strengthening (fortition) and weakening (lenition). Within our framework the weakening process will consist in the loss of elements from the internal representation of the segment while strengthening will be viewed in terms of the addition of elements to a given segmental make-up.

As mentioned above, syllabification into constituents proceeds from the governing relations established between the skeletal positions. The theory of government points to the existence of three syllabic constituents: the Onset, the Nucleus and the Rhyme. The coda is not awarded constituent status.

(3) a. Non–branching b. Branching

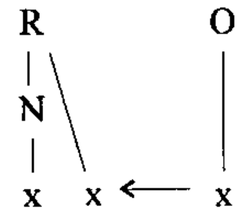


Following the requirements of the formal conditions on government all branching constituents are maximally binary. They form governing domains where the leftmost position is the governor and the one to its right the governee. Within a string of Onset – Rhyme positions, each onset is universally licensed by the following nucleus in accordance with the Onset-Licensing Principle: "Nuclei govern their onset regardless of their segmental content. In fact, even an empty nucleus is the governor of its onset" (Charette (1990:240)).

[1] For a detailed discussion of the element inventory see KLV (1985).

A governing relation which holds between a post-nuclear rhymal position and an onset provides a link between adjacent syllables. Transconstituent government is captured by the Coda Licensing Principle.

(4) *The Coda Licensing Principle* (Kaye 1990:311)
A post-nuclear rhymal point must be licensed by the following onset.



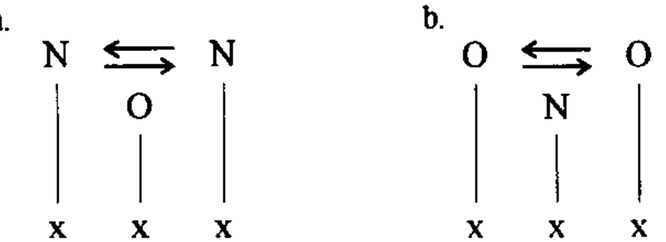
The application of this principle means the occurrence of branching rhymes only in the word-medial position. It disallows the association of word-final consonants with the 'coda' slot. Charette (1990:242) imposes another requirement on transconstituent government:

(5) *Government-licensing*
For a governing relation to hold between a non-nuclear head α and its complement β, α must be government-licensed by its nucleus.

Thus, in the structure depicted in (4) the onset will have to be government-licensed by the following nucleus in order to govern the preceding rhymal-complement point. This requirement also pertains to a branching onset where the leftmost head governs the complement to its right.

Government phonology also recognises another level of governing relation which exists between nuclei and onsets which are adjacent at some level of projection. In Projection Government the conditions of Strict Locality and Strict Directionality are often subject to language-specific parameters.

(6) *Projection Government*
a. b.



When the nuclear governee is empty it must not only be governed, it must be properly governed to remain unrealised. Proper government which is claimed to be a stronger form of phonological government is defined in (7) below:

(7) *Proper government* (Charette 1990:236)
A properly governs B iff
a. A governs B (A and B are adjacent on the nuclear projection)
b. A is not licensed.
c. No governing domain intervenes between A and B

Properly governed nuclei are subject to the Empty Category Principle proposed by KLV (1990:219) to the effect that

(8) *The Empty Category Principle*
A position may be uninterpreted phonetically if it is properly governed.

When the application of proper government is blocked for some reason the empty nuclei must receive phonetic content. Such a government failure can be observed in words where the empty nucleus follows a potential governing domain in languages where empty nuclei are not government-licensers. Such nuclei will have to acquire phonetic content to license the preceding governing domain.

In the following sections of this work we shall try to analyse Polish nasal vowels within the framework of Government Phonology. Let us begin by examining the relevant data.

2. *The evidence*[2]

The analysis to follow will concentrate on the distribution and representation of nasal vowels in Polish which have been subject to numerous studies (Jassem 1973; Gussmann 1974, 1980; Rubach 1977; Bethin 1992, and many others). At issue are two mid nasal vowels ę [ẽ] and ą [õ][3]. Nasal vowels generally appear only before continuants and word-finally while before non-continuant consonants we find sequences of oral vowels and homorganic nasal segments. The examples below illustrate this regularity.

(9)

kęs	[kẽs]	'bite'	dąb	[domp]	'oak'	idę	[idẽ]	'I go'
wąż	[võʃ]	'snake'	ręka	[reŋka]	'hand'	moją	[mojõ]	'my'
węch	[vẽx]	'smell'	księga	[kśeŋga]	'book'	są	[sõ]	'they are'
węzeł	[vẽzew]	'knot'	ląd	[lont]	'land'	stoję	[stojẽ]	'I stand'
wąwóz	[võvus]	'ravine'	bęben	[bemben]	'drum'			
gęś	[gẽś]	'goose'	dąć	[dońć]	'blow'			

It is also noteworthy that no nasal vowels occur before [l, r, w, j] nor any homorganic nasal-consonant clusters can be found in this context. Consider the words in (10) below:

[2] Some of the data concerning the nasal vowels in Polish come from Bethin (1992).

[3] The nasal vowels are in fact realised phonetically as diphthongs [eũ] and [oũ]. The present analysis, however, will not deal with this problem.

(10)

dąć	[dońć]	'blow'	dął	[dow]	'he blew'
			dęli	[deli]	'they blew'
zasnę	[zasnẽ]	'I'll fall asleep'	zasnęli	[zasneli]	'they fell asleep'

Moreover, nasal vowels in Polish do not occupy the word-initial position. This fact might imply that nasal vowels do not exist as phonological nuclear segments but are due to some processes the application of which yields the phonetic units [ẽ] and [õ]. It should be noted, however, that nasal vowels display certain unique properties which distinguish them from both oral nuclei and vowel-nasal clusters. Above all we should mention the phenomenon of consonant palatalisation before the front vowel [e]. Consider the examples in (11):

(11)

kiedy	[k'edɨ]	'when'
cień	[ćeń]	'shade'
biedny	[b'ednɨ]	'poor'
kopnie	[kopn'e]	'he'll kick'

Should we regard nasal vowels as oral vowel-nasal sequences the same effect would be expected before [ẽ]. This unfortunately does not take place as the examples in (12) clearly indicate:

(12)

kędy	[kendɨ]	'which way'
cętki	[centki]	'spots'
będę	[bendẽ]	'I'll be'
kopnę	[kopnẽ]	'I'll kick'

The nasal vowel ę differs from its oral counterpart in that it does not cause the palatalisation of the preceding consonant. Furthermore, if analysed as combinations of oral vowels plus nasal segments, nasal vowels differ from other such sequences in that in the former the nasal segment following the vowel is always homorganic with the neighbouring obstruent. In fact, only in this context do such sequences occur. On the other hand, when a nasal consonant follows an oral vowel, it need not be homorganic with the stop. Compare the words in (13a) and (13b):

(13)

(a)	dąb	[domp]	'oak'	(b)	słomka	[swomka]	'straw'
	ląd	[lont]	'land'		hańba	[xańba]	'shame'
	ręka	[reŋka]	'hand'		kumkać	[kumkać]	'croak'
	pręga	[preŋga]	'wale'		kanka	[kanka]	'nozzle'

The evidence concerning the nasal vowels in Polish presents a number of problems which our further analysis will have to account for. In the first place we

should discover the factors underlying their distribution. Specifically, the following alternations will have to be explained:[4]

(14)

wziął	[vźow]	wziąwszy	[vźõfʃɨ]	wziąć	[vźońć]	'take'
dęła	[dewa]	dąwszy	[dõfʃɨ]	dąć	[dońć]	'blow'
		prężyć	[prẽžɨć]	pręga	[preŋga]	'to stiffen/a wale'
		chorąży	[xorõžɨ]	chorągiew	[xoroŋg'ef]	'cornet/standard'
klęli	[kleli]	kląwszy	[klõfʃɨ]	kląć	[klońć]	'curse'

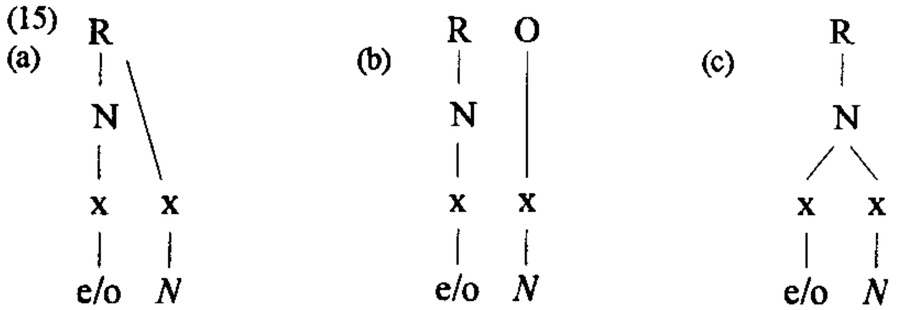
Secondly, we shall try to answer the question of why no nasal vowels appear in the word-initial position. Not less problematic is the occurrence of nasal vowels word-finally. Eventually, we will have to account for the unusual behaviour of nasal vowels with reference to palatalisation.

In the next part of this discussion the problem of nasal vowels in Polish will be analysed in terms of phonological government. In other words we shall look for their phonological representation and the licensing constraints which condition their 'behaviour', i.e. influence on the neighbouring segments.

3. *The analysis*

In this part we shall try to arrive at the phonological representation of nasal vowels in Polish and establish their role in the phonological system of Polish. The evidence presented above will be filtered through the network of universal principles and language-specific parameters. As mentioned above, one way of analysing nasal vowels is to propose that they are in fact combinations of oral nuclei and full nasal segments. The structures below illustrate this possibility:

(15)



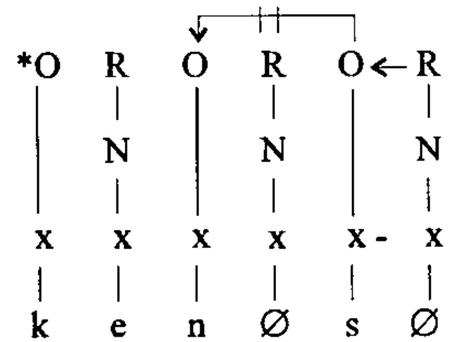
(*N* stands for the nasal segment.)

[4] The analysis to follow will deal with the alternations between the nasal vowel, the oral vowel and the vowel plus nasal consonant sequence, e.g. ẽ~e~em. Because of the great complexity of the problem of Polish nasal vowels, we shall not consider the front – back alternations, i.e. e~o.

As depicted above three main structures are available here — either the nasal segment resides in the rhymal complement position or it is dominated by an onset, or it is part of the nucleus as a nuclear complement. The first representation allows us to account for the place assimilations occurring between the nasal and the following non-continuant consonant thanks to the governing relation holding between the rhymal complement and the adjacent onset positions. This structure, however, seems highly implausible in the word-final position where nasal vowels appear. Specifically, it would violate the Coda Licensing Principle (CLP) which requires that the rhymal complement position be governed by the following onset (KLV 1985). It would also have to be explained why the nasal segment undergoes decomposition there. Put differently, in order to escape violation of the CLP the skeletal point dominating the nasal would have to be projected to the nucleus, which in turn would yield a long vowel. Polish, however, lacks underlying distinctions in vowel length, which also 'disqualifies' the structure in (15c).

The second representation (15b) appears even less probable. The emergence of a nasal vowel in this case could only be due to the lenition of the nasal segment. In the word-final position it might be postulated that nasal reduction is a consequence of the fact that the onset position is prosodically licensed by an empty nucleus.[5] Being so licensed, the onset would not have enough power to autosegmentally license its elements.[6] Still, attributing the occurrence of nasal vowels to nasal reduction we cannot forget about a great number of words terminating in a single nasal consonant, e.g., *dom* [dom], 'house', *on* [on] 'he', etc. Why then no nasal decomposition takes place in these words as well? In the word-medial position, it would be very difficult to capture the regularity of occurrence of nasal vowels before continuants and place assimilations between the nasal segment and the following obstruent. We would have to resort to the interonset government as the motor driving that process.[7] Look at (16) below:

(16)



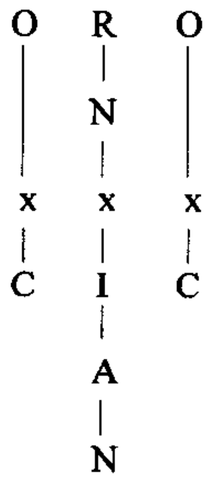
[5] "Under prosodic licensing, each unit in the prosodic hierarchy is required to belong to some higher order structure" (Harris (1994: 155). Here, the nucleus prosodically licenses the preceding onset as a manifestation of the Onset-Licensing Principle. An empty nucleus is regarded as a weak licenser.

[6] Autosegmental licensing regulates the attachement of elements to skeletal positions. Harris (1992: 2) introduces the principle of *Licensing Inheritance* to the effect that: "a licensed position inherits its

The structure above clearly depicts that no interonset government is possible between the nasal and the following fricative [s]. The basic obstacle for establishing this sort of relation is the fact that interonset government between segmentally complex positions cannot be bi-directional. It has been established that interonset government in Polish operates from left to right.[8] If an interonset governing domain cannot be established between [s] and [n] the empty nucleus separating the segments remains unlicensed and hence should be realised phonetically. This would obviously yield an non-existing word in Polish. All in all, the problems discussed above lead us to the conclusion that the representation of the nasal vowels in Polish as nucleus-onset sequences fails to meet the evidence.

Alternatively, it could be proposed that nasal vowels have the phonological structure similar to that of their oral counterparts with the difference that they contain the nasal element in their segmental make-up.

(17)



[ẽ][9]

Leaving aside the problem of palatalisation for the time being, let us see whether such a representation meets the evidence. Given this structure we can account for the presence of nasal vowels in the word-final position and medially before continuants, e.g. *kęs* [kẽs]. Nevertheless, it seems problematic to explain the absence of nasal vowels before [l, r, w, j] as in *wzięli* [vźeli] or *dął* [dow]. The difficulty consists in the fact that there is no governing relation between the nucleus and the following onset. Thus, the onset cannot affect in any way the segmental com-

a-licensing potential from its licenser". Hence, if a given position is licensed by a weak prosodic licenser it may receive little licensing potential and be unable to autosegmentally license its elements.

[7] Recall that interonset government is an instance of projection government. The Complexity Condition and the Government-licensing Principle also obtain in the case.

[8] For the discussion of this problem see Gussmann and Kaye (1993).

[9] The front vowel [e] is composed of two elements I (-back) – the head and A (-high) – the operator.

position of the preceding nucleus. Hence we would expect the form [vźẽl'i] rather than [vźel'i]. Furthermore, this representation does not make it clear why nasal vowels are barred from occurring in the initial position of the word.

Having considered the traditional ways of representing nasal vowels in Polish let us see whether Government Phonology offers some other tools for providing a unified account of this problem.

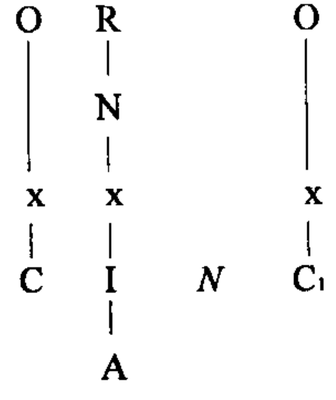
4. *Nasal vowels and the theory of phonological government.*

The data presented in the previous sections of this paper show that an insightful analysis of nasal vowels in Polish should provide answers to the following questions:

1. Why do we have nasal vowels only before continuants and word-finally?
2. What factors are responsible for place assimilations arising between the 'nasal part' of the nasal vowel and the following non-continuant segment?
3. What makes it impossible for nasal vowels to appear before [l, r, w, j]?
4. In what way do they differ from oral vowels – e.g., with reference to palatalisation?
5. Why are they barred from occurring in the initial position of the word?

What all the above questions amount to is in fact the necessity to provide the phonological representation of nasal vowels and uncover the licensing constraints they are subject to. The representation of a nasal vowel should capture the relationship that exists between the 'nasal part' of the nasal vowel and the following onset as well as make it clear why nasal vowels do not appear word-initially but they do word-finally. With all this in mind, let us consider the following representation:

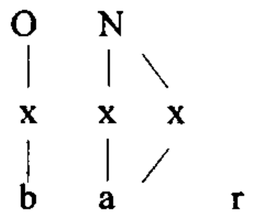
(18)



(C stands for a consonant segment.)
(*N* stands for a nasal segment.)

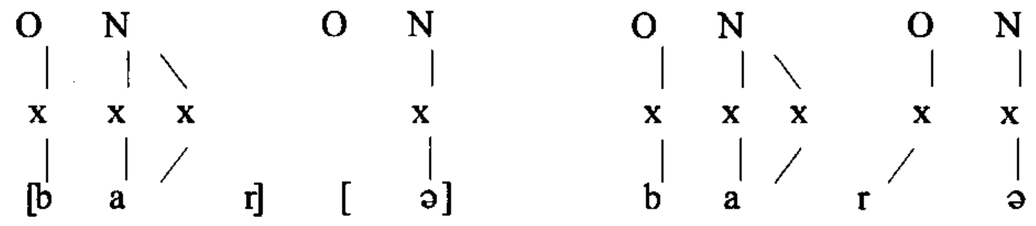
The above structure assumes the existence of a floating nasal segment with no syllabic position of its own. This possibility is clearly made available by the phonological theory and made use of in various languages. One example of this sort of representation is provided by Harris (1994:248) where the author analyses the problem of the post-vocalic [r] in English. Let us illustrate this phenomenon with the word bar [ba:].

(19)



Since in non-rhotic languages only an onset position licenses [r] (Harris 1994: 248) and no available onset slot is present in the representation the [r] segment remains unattached and hence unrealised. The situation is radically different in a sequence such as **bar a.** Look at (20) below:[10]

(20) bar a.. [ba:rə]

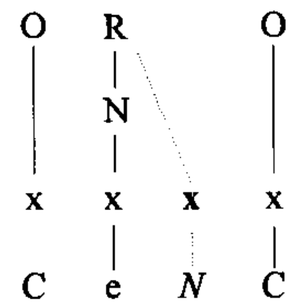


As indicated above [r] becomes associated with the available onset position, which automatically triggers the creation of a skeletal slot. Should the onset in question be already occupied (e.g., bar the [ba:ðə]) there would be no skeletal position which could autosegmentally license the [r] segment.

Coming back to our representation of the nasal vowel, we might postulate a similar mechanism determining the realisation of the nasal segment. Specifically, it can be noticed that in the word-medial position the onset slot following the nasal vowel is always occupied by a consonant segment. Hence, the only possibility for the nasal segment of being manifested is through its association with the preceding rhyme. Such an attachment would trigger the automatic creation of a skeletal point of the rhymal complement. Consider (21) below:

[10] The examples and their lexical representation have been quoted from Harris (1994).

(21)

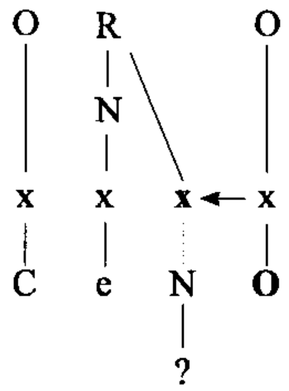


(*N* stands for the nasal segment and C for a consonant.)

It has to be remembered, however, that the emergence of a rhymal complement position brings about the creation of a governing relation between this position and the adjacent onset. Hence, it seems reasonable to expect that the skeletal position will be established only when the substantial conditions for transconstituent government are satisfied. In the first place for a segment to occupy a governing position it must fulfil certain complexity requirements. For one thing the potential governee may not be more complex than its governor. If our potential governee is the nasal segment [m] or [n] then [r], [w], [l] and [j] have to be excluded from the governing onset position. In other words, the floating nasal segment will not be projected to the rhymal complement point if the onset to its right is linked to [r, l, w, j] as these are less complex than the nasal. Furthermore, it must be kept in mind that the governing relation holding between the rhymal complement and onset positions sanctions the autosegmental licensing of the segmental material dominated by the former. Harris (1994:68) claims that "in true coda-onset clusters, the identity of the second consonant partially determines the identity of the first." The 'coda' position, moreover, cannot license the elements for place of articulation and the laryngeal elements (H and L corresponding to stiff and slack vocal cords respectively) which are distinctively specified in the onset and spread to the governee under transconstituent government. It is no accident, therefore, that in most languages the 'coda'-onset clusters are geminates or partial geminates (Harris 1994).

Returning to the representation proposed in (21), the presence of an obstruent in the onset which follows the 'nasal vowel' will create suitable conditions for the establishment of a governing relation with the floating nasal segment and hence the skeletal slot of the rhymal complement will appear. Being prosodically licensed by its onset, the rhymal complement position will autosegmentally license the N (nasality) and ? (occlusion) elements but not the place of articulation element. Consider the structure in (22):

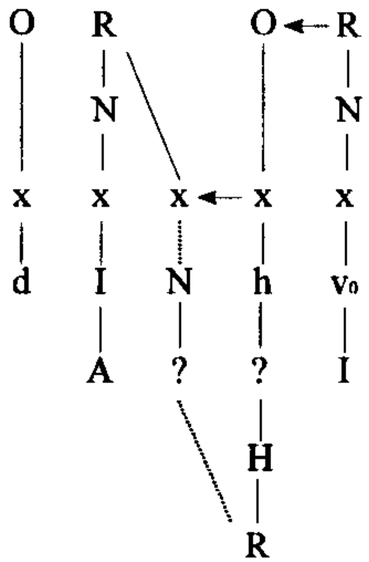
(22)



(**O** stands for an obstruent)

Given the above theoretical considerations let us see how they can be applied to the concrete data exemplifying the distribution of nasal vowels in Polish. Recall that we find nasal vowels only before fricatives and word-finally as in *dąwszy* [dõfʃɨ] or *się* [śẽ]. With the following stop or affricate consonants homorganic sequences are obtained, e.g., *dęty* [dentɨ] or *dąb* [domp]. The adjacent [l] or [w] do not affect the preceding rhyme, e.g., *dęła* [dewa]. The structure in (23) envisages the phonological representation of the word *dęty*.

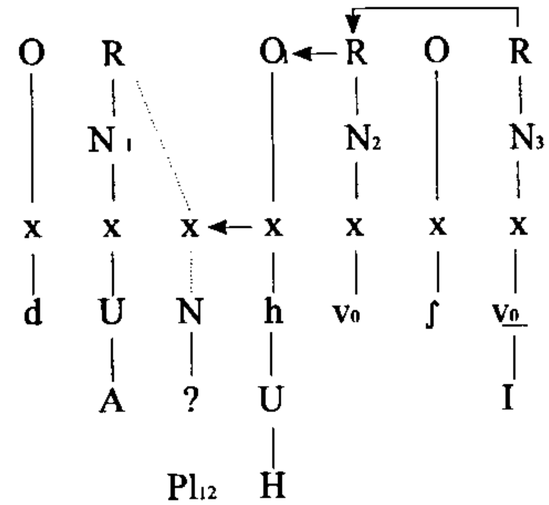
(23)



As depicted in the above structure, the adjacency of the coronal obstruent [t] to the nucleus followed by a floating nasal segment gives rise to the creation of a rhymal complement slot to which the nasal can be associated. This is possible only due to the governing relation which is established between the newly created slot and the following onset position. It was mentioned before that the 'coda' position cannot license the place element nor the laryngeal one. Hence only the N and ? become linked to the available skeletal slot. The element for the place of articulation R (coronality) which is distinctively specified in the onset is docked onto the preceding governed position, which gives rise to a homorganic cluster [nt]. Needless to say, the onset position has to be government-licensed by the following nucleus in order to discharge its governing capacity.

Now let us turn to the contexts where the nasal vowels do surface phonetically. This phenomenon can be observed before continuant consonants and at the end of words. We shall first consider the representation of the word *dąwszy* [dõfʃɨ] 'blowing'.

(24)[11]



The representation in (24) shows that the nuclear position N_1 which is followed by the floating nasal segment has to its right the onset dominating the continuant [f]. It can be observed that the onset segment is equally complex as the unassociated nasal, the number of elements being three in each case. Thus potentially, the governing relation between O_1 and the rhymal complement position could be established without violation of the Complexity Condition. This, in turn, leads to the

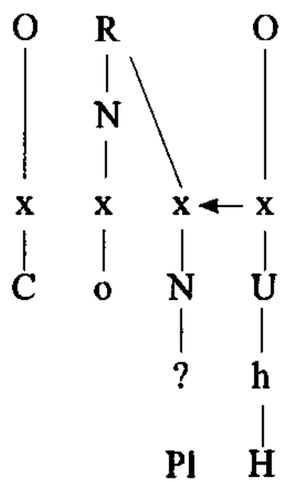
[11] The U element specifies roundness in vowels and the h element stands for 'noise'.

[12] Pl corresponds to a place of articulation element. At this stage of research, however, I will not argue for either the U or the R element occupying this position. The evidence concerning this question seems to provide arguments for either possibility. On the one hand the choice of the U element as our place element could account for the phonetic interpretation of nasal vowels as diphthongs [eũ] and [oũ]. Additional support comes from certain word alternations such as *dąć ~ dmę, odjąć ~ odejmę* which indicate that the nasal segment is [m]. However, there are also numerous examples contradicting this option: *piąć ~ pnę, ciąć ~ tnę, kląć ~ klnę*, etc. Moreover, we can also find words where both [m] and [n] can occur, e.g. *wyżąć ~ wyżmę ~ wyżnę*.

creation of the skeletal point to which the elements of the floating segments could attach. The newly-emerged position is then projected to the preceding Rhyme. The question arises, however, how many elements of the floating segment will be autosegmentally licensed and hence linked to their slot? Why don't we come up with a homorganic cluster as we did in the case of the following stop consonant in (23)?

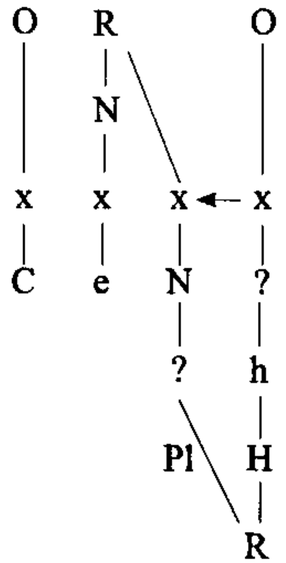
Harris (1994:174) argues that in the case of 'coda'-onset clusters "the amount of melodic material that a coda position can sustain is tightly constrained, an effect that is due to the governance of this position by a following onset." Precisely, there exists a universal slope in complexity whereby the head (onset) should dominate more elements than its complement. When we confront this requirement with the above nasal-fricative cluster we find it definitely offending. Therefore, it has to be concluded that the skeletal point for the floating segment is created thanks to the fact that the nasal and [f] constitute a potential well-formed transconstituent governing domain which obeys the Complexity Condition. Yet, the amount of autosegmental licensing that the new position is endowed with by its governing onset must comply with the universal requirement of the upward cline in complexity for the rhymal complement-onset relation. Keeping all this in mind, it could be postulated that the stronger the governor the more autosegmental licensing power the governee is endowed with. As a result, more elements of the governed segment can be associated with their position. The more complex the internal composition of the governor the stronger it seems to be. Applying the above observations to our nasal-fricative sequence, [f] appears to be a weaker governor than was [t] in [dentɨ]. Hence, the position governed by it would be expected to license fewer elements than that governed by [t]. Compare (25a) and (25b) below.

(25) a.



[*N*f]

b.



[nt]

Since the post-nuclear rhymal position in (25a) is governed by an onset dominating a fricative, it cannot license the place defining element which is not attached.The licensed elements are the ? element and the nasal element, which phonetically yields the nasal vowel [õ]. In the case of the nasal stop cluster, the coda position cannot license the place defining element but it is supplied by the governing onset. One might wonder, however, why the place element U does not spread from the governing onset occupied by the fricative [f] to the governed position, thus bringing about the creation of the homorganic cluster. Recall that this was the case in [dentɨ]. Polish, however, does not seem to like homorganic nasal-fricative clusters. In native Polish words such sequences simply do not occur. Therefore, it is not surprising that even in borrowings they tend to be eliminated. Consider the examples in (26) below:

(26)

amfora	[ã$^{(u)}$fora]	'amphora'
instrukcja	[ĩstrukcja]	'instruction'
emfaza	[ẽ$^{(u)}$faza]	'emphasis'
szansa	[ʃãsa]	'chance'
awans	[avãs]	'promotion'
transmisja	[trãsmisja]	'transmission'
symfonia	[sĩfon'ja]	'symphony'

Alongside these forms we can easily find borrowed words with homorganic nasal-stop clusters, e.g., *empiria* [emp'irja] 'empiricism', *ambicja* [amb'icja] 'ambition' or *banknot* [baknot] 'note'. Interestingly enough, non-homorganic nasal-fricative clusters seem to be perfectly acceptable in borrowings. Consider (27) below:

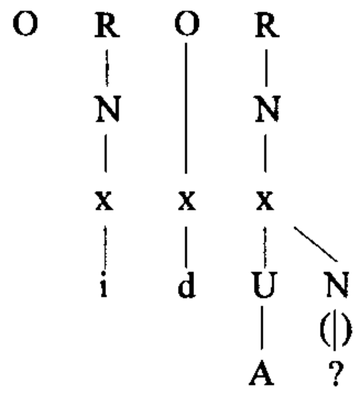
(27)

informacja	[in**f**ormacja]	'information'
konferencja	[kon**f**erencja]	'conference'
konwencja	[kon**v**encja]	'convention'

The data presented above imply that the nasal-fricative clusters differ from the nasal-stop sequences in that the latter must be homorganic while the former may not. Hence the place of articulation element spreads from the onset occupied by a stop consonant (see (23)) but no such sharing is allowed when the onset dominates a fricative. A fricative seems to be a weaker governor than a plosive and hence a position it governs does not receive enough licensing potential to license all of its elements. Hence the place element cannot attach to the skeletal point but simultaneously it cannot be supplied by the following onset.

The nasal vowels also manifest themselves in the word-final position as in *idą* [idõ] 'they are going'. Let us consider the phonological representation of this word.

(28)

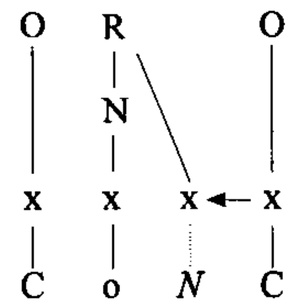


Pl

The word in question terminates in a floating nasal segment which can only be projected to the preceding rhyme. Still, it may not create any new skeletal position. Otherwise, i.e. if a post-nuclear rhymal complement point were created the structure would violate the Coda Licensing Principle as there would be no onset to license it. What is more, the new position could not be projected to the nucleus because Polish does not have long vowels. The only possibility for the elements to be licensed is by the existing nuclear point. If this is the case a contour structure arises through the association of the N (and ?) element with the nuclear position. It might be objected, however, that if the floating elements can be licensed by the nucleus why does it not happen word-internally? Why don't we have [dẽtɨ] but [dentɨ]? This question is to a certain extent a question about the nature of government. If we want to maintain the assumption that the governing relation is the primary source of phonological events we should also give it priority in licensing the melodic elements. In the case of a floating consonantal segment which seeks the way to manifest itself the first possibility would be to attach to the available, unoccupied onset position. If no such position exists within a given domain, an alternative solution would be to dock onto the preceding post-nuclear rhymal slot. In the latter case the newly created position will be prosodically licensed by the following onset from which it will inherit its autosegmental licensing potential. [13] Thus, when the skeletal position emerges to the right of a given nucleus, the governing relation it comes into with the following onset has precedence in licensing its melodic content.

[13] This state of affairs is imposed by the Licensing Inheritance Principle (Harris 1994:206).

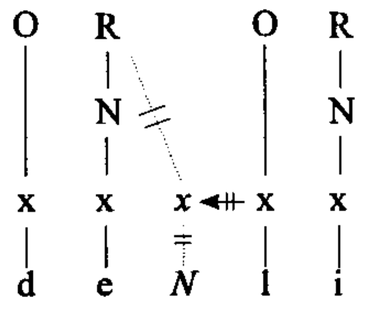
(29)



As indicated above the 'coda' receives its autosegmental licensing power from its onset governor. In fact, the ultimate source of this power is the nucleus following the onset. Therefore, the licensing potential it inherits is doubly depleted. The above observations concerning the nature of transconstituent government suggest that word-internally the following onset will always have priority in licensing the melodic content of a floating segment as its potential governor. Recall that the relationship that exists between the nuclear head and the rhymal complement position is not that of government. The situation is different at the end of words where the unassociated nasal segment is not followed by any potential governor. There the preceding nuclear position has free access to its elements and may license them.

If our predictions concerning the licensing of floating segments are correct, it will be easier for us to account for the absence of nasal vowels before [l] and [w]. If we stick to the assumption that for a floating element to manifest itself word-medially it must be autosegmentally licensed either by the empty onset position or through transconstituent government we have to conclude that these licensing paths are unavailable when the segment which follows is [l] or [w] (or [r] and [j]). The difficulty consists in the fact that they are not complex enough to become governors for the nasal segment. If we also bear in mind the implications of the Licensing Inheritance Principle it becomes obvious that the floating segment has to remain unattached and hence unrealised phonetically.

(30)

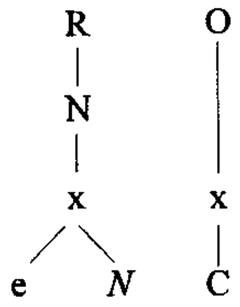


The structure in (30) depicts the phonological representation of the word *dęli* [dẽli] 'they blew' where the floating nasal segment precedes the onset dominating [l]. Since the liquid cannot govern the nasal no governing domain can be established

between [l] and the preceding segment, which makes it impossible for the floating segment to be projected to the preceding rhyme.[14] Thus, no skeletal position is created to which the segment might attach. In consequence, it is not manifested phonetically.

So far we have been considering the hypothesis formulated in (18) which assumed the existence of a floating nasal segment in the representation of the nasal vowel. Such a representation made it possible for us to account for the occurrence of nasal vowels before fricative consonants and word-finally, the homorganic nasal fricative clusters and the lack of nasal vowels before liquids and glides. The structure presented in (18), however, seems somewhat imperfect. Namely, we do not find floating segments within a morpheme. It is expected to occur at word (domain) edges. It appears, therefore, that our nasal segment must be linked to some skeletal position. As we have rejected the possibilities of its being associated with a separate onset position, a coda position and the nuclear complement point, a plausible way out of this situation is to postulate that the nasal segment is part of the nuclear short diphthong structure.

(31)

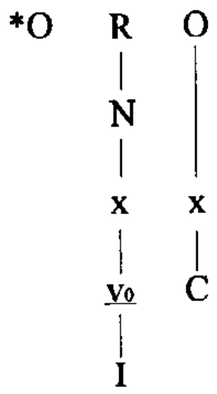


Since the onset has no influence on the segmental make-up of the preceding nucleus it cannot take active part in the emergence of the nasal vowels nor the nasal-stop clusters. Hence, the causes of this peculiar short-diphthong breaking have to be attributed to some language-specific parameter settings. The absence of long vowels in Polish can lead us to the conclusion that Polish tends to eliminate all sorts of complexity from the nuclei. In the word-medial position, the detached nasal segment will seek the way to be realised phonetically through the association with an automatically created rhymal complement position. As already discussed the licensing of its elements will depend on the nature of the following onset segment. Word-finally, since the nasal segment cannot be 'taken over' by any potential governor, it becomes either partially or completely delinked from its skeletal position. Hence, we are likely to find both nasal vowels and oral vowels in this position (in dialectal forms), e.g. będę 'I will be' [bendẽ] ~ [bende]. There are also dialects where the expected form will terminate in a full nasal consonant, i.e. [bendem].

[14] The liquid segment is composed of two elements – R and ? as opposed to three elements of the floating nasal (U/R, ?, N). [l] does not dominate the laryngeal element L as sonorants are characterised by the spontaneous type of voicing (uninvolved in phonological processing) which cannot be specified distinctively in a sonorant segment. For more details concerning this problem see Harris (1994: 135).

Let us now turn to the word-initial position and try to discover the factors underlying the absence of nasal vowels here. Within the theory of Government Phonology certain sequences are barred from occurring in the initial syllable of the word. Specifically, the sequence of an empty onset followed by an empty nucleus is ruled out. In many languages there are specific parameters which prohibit the occurrence of certain segments word-initially. If we consider Polish which is of primary interest for the present discussion we find that the nasal vowels share the lot of the vowel [ɨ]. There are no words in Polish which would begin with [ɨ].

(32)



It also should be remembered that pure empty nuclei do not appear word-initially.

The distributional deficiency of [ɨ] just as that of the nasal vowels cannot be accidental. Rather it should be attributed to some Polish-specific parameter. Notice that [i] can freely occupy this position, the difference between [ɨ] and [i] consisting in the v^o – headedness of the former and I – headedness of the latter.[15] It seems that it is the cold element v^o which is responsible for the absence of the lax front vowel at the beginning of words. It appears possible that Polish does not allow a sequence of two empty headed positions domain-initially (i.e. the onset is empty and the following nucleus cold-headed). In some way the cold-headed nuclear position requires the support of a segmentally complex onset. It should be noted that v^o headed nuclei are particularly susceptible to all kinds of reductions. We could propose, therefore, that the necessity to license the preceding segmentally complex onset prevents the following nucleus from being reduced. With reference to this Harris (1990) postulates the following constraint:

(33) Segments which discharge governing responsibilities are immune to processes whose effect is to reduce complexity.

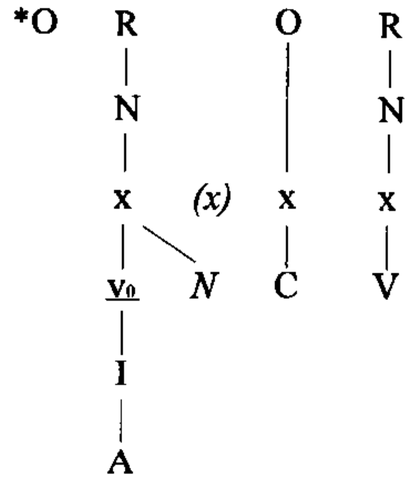
Although the above observation applies to governors it might be the case that Polish makes use of this constraint whenever a cold-headed nucleus is responsible

[15] Harris (1994:111) argues that the v^o element is latently present as a dependent in all vocalic expressions but becomes audible when it is granted the status of the head. In such a case other elements are either suppressed or moved to the dependent positions.

for licensing the preceding onset elements. Otherwise, i.e., if the nucleus were preceded by an empty onset and dismissed from the 'licenser's obligations' it could undergo reduction, thus creating the offending sequence of two empty positions.

If the above line of reasoning is correct we could attribute the non-occurrence of nasal vowels in the word-initial position to their being cold-headed.

(34)



The nasal vowels would be liable to the same restriction as the lax vowel [ɨ]. Specifically, the nuclear position will need an onset dominating some segmental material to be autosegmentally licensed in order to preserve its own elements.

It is also noteworthy that nasal vowels and the lax vowel share one more interesting feature. Namely, they do not palatalise the preceding consonant, which takes place before [i] and [e]. Consider the examples below:

(35)

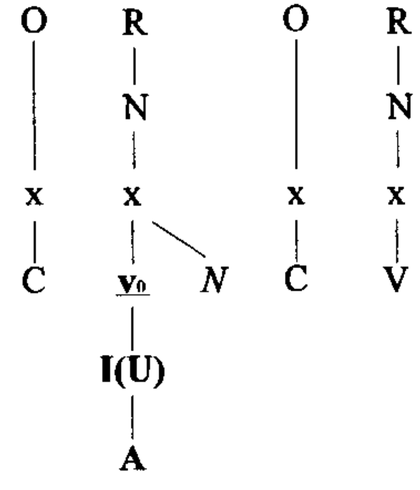
kęs	[kẽs]	'bite'	kiesa	[k'esa]	'purse'
pęk	[peŋk]	'bunch'	bies	[b'es]	'devil'
być	[bɨć]	'to be'	piwo	[p'ivo]	'beer'
syn	[sɨn]	'son'	siwy	[s'ivɨ]	'grey'

The element responsible for the palatalisation of consonants is I which appears in the segmental make-up of high front vowels. The nucleus-onset licensing constitutes the path through which spreading of the I element is achieved. A closer look at the above words leads us to the conclusion that I spreads only when it occupies the head position. This explains palatalisation before [e] and [i]. However, in [ɨ] and nasal vowels the element in question has a dependent status since the head position is filled with the cold element v^{o}. This blocks the spreading of palatalisation from these nuclei onto the preceding consonants.

5. *Summary*

In the above sections we have been concerned with the problem of nasal vowels in Polish. Having analysed the relevant evidence we have proposed the following phonological representation of the nasal vowel.

(36)



It has been postulated that the nasal vowel is neither a single prosodically complex nuclear position nor a sequence of a nucleus dominating an oral vowel and an onset linked to the nasal segment. We have suggested the existence of a floating nasal segment after the nucleus which is or is not projected to the preceding rhyme, depending on the nature of the adjacent consonant. Such a representation, however, had to be rejected since it is unusual for the floating segments to occur morpheme-internally. Alternatively, we proposed that the nasal segment be part of the short diphthong which undergoes decomposition due to the Polish-specific parameter eliminating complex nuclear structures. The elements of the delinked segment are licensed to attach to the rhymal complement position if transconstituent government with the onset segment as a governor is possible. The number of elements licensed, on the other hand, depends on the complexity of the governing segment and universal constraints concerning the 'coda' position. We also have argued for the precedence of the governing relation in licensing the unassociated segmental material. In the word-final position where no potential onset governor follows the detached segment the licensing of the elements depends on the language parameter. In order to account for the absence of nasal vowels in the word-initial position we have modified their phonological structure by promoting the cold element to the nuclear head position. We also have seen that this kind of representation helps us explain the inability of nasal vowels to palatalise preceding consonants. The analysis has not been concerned with the appearance of the [u] glide as in the word [kẽ^{u}s]. The problem has only been anticipated by suggesting that the nasal segment might be [m] and remains to be further investigated.

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