3. LONG VOWELS: DIAGNOSTIC CONTEXTS FOR PHONOLOGICAL STRUCTURES

3.1. Introduction

We have seen that the propagation of 'I' in palatalised environments results in various vocalic alternations. The direction of I-spreading is from right to left, i.e. the same as that of internuclear government. In this situation 'I' becomes the head of the vocalic expression it docks onto. Additionally, a process resembling vowel harmony has been observed whereby the element 'A' is spread from the following nucleus. Although both palatalisation spreading and A-harmony accord with the direction of internuclear government, only the latter can be maintained to be an instantiation of that relation. I-propagation, on the other hand, must be independent of internuclear government, as it is allowed to apply across governing domains (cf. the discussion of [k´ark / k´irk´ə] (2.3.5)).

Another important observation is that the elements 'I' and 'U' of palatalised and velarised consonants can be shared by the consonant and a following nucleus (by the *Sharing Condition*). In this context only shared 'I' seems to affect a headed nucleus phonetically ([f´ar]),[1] while shared 'U' constitutes a barrier to palatalisation spreading e.g. [k^{w}id´] *cuid* "part", but does not influence the nucleus unless there is no other source for an active element in the nucleus (cf. [pu] *puth* "breeze").

In the introductory sections we saw the absence of interaction between palatalised consonants and long vowels; Ní Chiosáin (1992) allows for this by specifying long vowels for the feature [±BK], hence, no spreading of that feature is possible from flanking consonants. Recall the, by now familiar, examples.

[1] A similar phenomenon is observed in the case of long [ɑ:] which tends to be fronted if preceded by a palatalised onset (Ó Cuív (1975:18)).

(1)

a.	[kˊu:nˊ]	*ciúin*	"calm"
	[kˊi:lˊ]	*cíl*	"raddle"
b.	[ti:]	*tuí*	"straw"
	[tˊi:]	*tí*	"house gs."
c.	[ku:ʃ]	*cúis*	"reason"
	[kˊu:ʃ]	*ciumhais*	"edge"
d.	[kɑ:s]	*cás*	"case"
	[kɑ:ʃ]	*cáis*	"cheese"
e.	[ge:lˊ]	*Gaeil*	"Irishmen."
	[gˊe:lˊ]	*géill*	"surrender"
f.	[bo:]	*bó*	"cow"
	[bˊo:]	*beo*	"alive"

Thus the strict dependence of short nuclei on the flanking consonants, i.e. *CiC and *C´uC´, is relaxed here, and Ci:C and C´u:C´ are possible in the case of long vowels.

(2)

C´u:C´	[kˊu:nˊ]	*ciúin*	"calm"
Ci:C	[ki:səχ]	*cuíosach*	"fairly good"

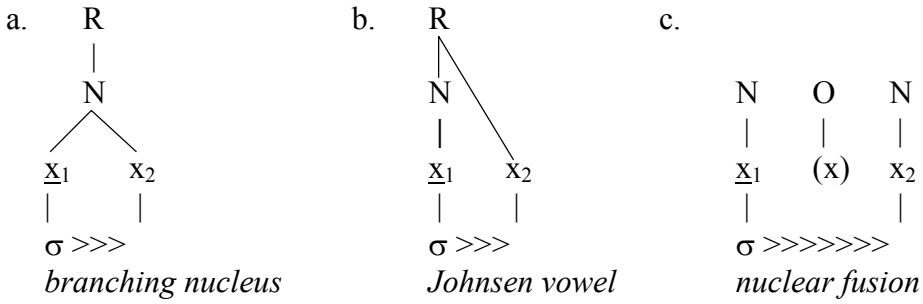
In GP this discrepancy between the behaviour of short and long vowels cannot be handled by feature manipulation, and other ways of accounting for phonological processes or their absence must be sought. It appears, however, that the facts concerning the behaviour of Irish long vowels and diphthongs are much more complex than the data in ((1)) may suggest. In this chapter we will consider cases where phonetically long vowels are in fact affected by the elements defining the quality of consonants, and show that the effects depend both on the formal (syllabic) and substantive (melodic) structure of long vowels. It will be shown how different structures produce different effects which in most cases resemble the facts encountered in the short vowel alternations.

First, various sources for long vowels in Irish will be discussed and appropriate structures proposed. Then instances of long vowel-consonant interaction will be considered. Finally, we return to the question of the immunity of long vowels to external influence.

3.1.1. **Sources and structures of long vowels**

Let us begin by stating the uncontroversial fact that in Irish not all long vowels are long underlyingly. Some of them will be shown to result from lengthening of lexically short vowels while others, although lexically long, need not be understood in a traditional way, i.e. as branching nuclei. Below, we introduce three types of representations for long vowels which will be discussed in this chapter.

(3)



((3)a) represents a branching nucleus which can be regarded as the structure of a true long vowel.

((3)b) was proposed by Lars Johnsen in Kaye, Hellan and Johnsen (1990) for Norwegian, and henceforth will be referred to as the "Johnsen vowel".[2] This vowel in which the melody from the nucleus spreads onto a metrically created position (x_2), to some extent resembles the structure to be proposed below for Irish. In both cases we are dealing with an underlying short nucleus which can either remain short or be lengthened depending on certain conditions. However, in Irish, the extra position is not created metrically. It is there underlyingly in the form of an empty non-nuclear rhymal position, i.e. a rhymal complement of a sonorant geminate (Cyran (1992, 1996a)). Thus the Irish version of the "Johnsen vowel" simply constitutes a case of compensatory lengthening rather than a metrical lengthening. An additional difference between the original "Johnsen vowel" and the Irish case lies in the fact that no melody spreading from the nucleus is required in the latter. This structure will be discussed at some length in 3.2 below.

[2]See Kaye (1992/96:310) for a discussion of that structure.

((3)c) represents a situation where two consecutive nuclei are fused under government. This structure requires an empty onset with or without a position. Both possibilities will be shown to exist in Irish in later sections. The main aim is to demonstrate that these structures behave disparately with respect to I-propagation, and thus need to be postulated to exist in Irish side by side. The different behaviour of these three structures is illustrated in ((4)), where the data sets (a), (b), and (c) correspond to the representations (a), (b) and (c) in ((3)).

(4)

a.	[kɑ:s]	*cás*	"case"
	[kɑ:ʃ]	*cáis*	"cheese"
	[ʃk´i'bo:l]	*scioból*	"barn"
	[ʃk´i'bo:l´]	*sciobóil*	"barn-gs."
b.	[k´aun]	*ceann*	"head"
	[k´i:n´]	*cinn*	"head-gs."
	[laum]	*lom*	"bare"
	[li:m´]	*loim*	"bare-gs."
c.	['k´u:nig´]	*ciúnaigh*	"calm-voc."
	[k´u:'ni:m´]	*ciúnaím*	"I calm"
	[k´u:'nu:]	*ciúnú*	"calming (V.N.)"

The initial assumption is that branching nuclei are not affected by palatalised consonants which is shown above in ((4)a). Below we will consider the possibility that the *Minimality Condition* (Charette (1989)) might take effect here. As for ((4)b), which shows the surprising [au / i:] alternation, it will be claimed that the melodic interaction obtains in exactly the same manner as in the case of short vowels, which will follow from the representation of such vowels. Namely, these are cases of compensatory lengthened vowels, hence the interaction with element spreading. Finally, the situation in ((4)c) will be dealt with at some length in 3.4 as there are a few aspects to consider.

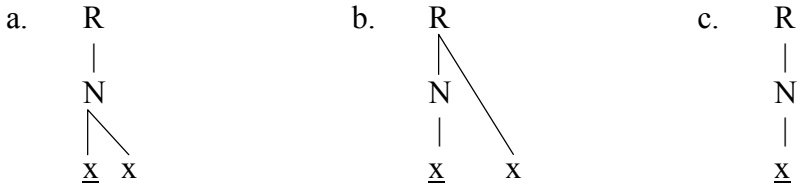
3.1.2. **The Minimality Condition**

We have seen that I-propagation differs from A-harmony in Irish in that palatalisation spreading is not directly dependent on internuclear government. This difference is manifested in, for example, the possibility of 'I' to propagate across governing domains which is ruled out in the case of A-harmony. The alternation [k´ark / k´ir´k´ə] "hen/gs." as opposed to [sp´al / sp´el´ə] "scythe/gs." illustrates this difference (cf. 2.3.5). In the case of A-harmony we also expect that this process will not affect long vowels. Can we say that I-propagation should also be unable to affect branching constituents, i.e. a branching nucleus? The question is whether we can explain the immunity of long vowels to the two processes by employing just a single condition which refers to their syllabic structure.

In GP all syllabic constituents are maximally binary and form head initial governing domains (KLV (1990)). The binarity theorem ensures that the governing relations in syllabic constituents are strictly local. The direction of constituent government is universally head-initial. Thus any ternary constituent structure would violate one of these formal conditions (1.2.1).

With relation to rhyme structure, the theory of government predicts three possibilities, presented in ((5)):

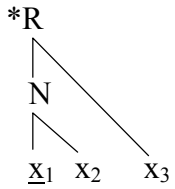
(5)



((5)c) is not a governing domain while ((5)a,b) represent the only possible rhyme structures which do not violate the conditions outlined above. On the other hand, GP precludes a structure of the following type.[3]

[3]Harris (1994a) suggests that the stringent principles defining syllabic constituents should be relaxed to accommodate such cases of super-heavy rhymes as English *find*, *chamber* and *draft*.

(6)



Such a structure violates the locality condition as x^1 and x^3 are not adjacent and no governing relation can be established between them. The structure in ((5)a) represents long vowels and heavy diphthongs which in Irish may not be affected by transmission of the element 'I'.

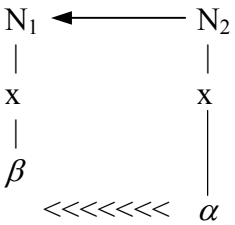
It has been proposed that governing domains resist government by a remote governor.[4] In phonology, the Minimality Condition was examined by Charette (1989). In order to account for the asymmetry in the behaviour of branching and non-branching constituents she proposes that phonological government is subject to the minimality condition.

THE MINIMALITY CONDITION

α does not govern β if γ is the IMMEDIATE projection of δ excluding α.

To understand what is meant by this definition let us imagine that in a given language the nuclei N_1 and N_2 normally contract a governing relation in which N_1 is governed by N_2.

(7)



[4]The Minimality Condition was first proposed by Chomsky (1986) for syntax.

One possible outcome of such a relation may be the spreading of melodic material from the governor (N_2) to the governee (N_1).[5] To illustrate this phenomenon Charette provides the following examples of Korean umlaut.

(8)

Radical	*Subject*	*Gloss*
[pam]	[pæm-i]	"night"
[tam]	[tæm-i]	"wall"

The mutation is described as the propagation of the element 'I' of the subject marker (the suffixal vowel) to the stem vowel under internuclear government, which results in the (I.A) combination.

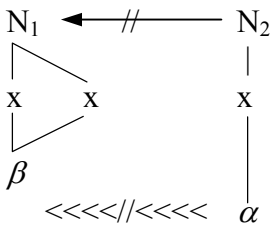
However, in the case of long vowels the propagation is blocked.

(9)

Radical	*Subject*	*Gloss*
[pa:m]	[pa:m-i]	"chestnut"
[ta:m]	[ta:m-i]	"energy"

It is in ((9)) above that the Minimality Condition investigated by Charette takes effect due to the fact that the governee in such forms (N_1) itself constitutes a governing domain (a branching nucleus) as shown below.[6]

(10)



[5]In "non-dynamic" terms spreading may be understood as the static identification of a governed (licensed) position with its governor (licenser) with respect to melodic material lexically lodged in the latter (see e.g. Harris (1990b)).

[6]This is an indecently oversimplified illustration of the application of the Minimality Condition as it does not include the relevant projections mentioned in the definition. The reader is referred to Charette (1989) for details.

Under our analysis, the process of palatalisation transmission in Irish appears to be parallel to Korean umlaut in that it can affect short vowels only, but this does not seem to take place under government (except for A-harmony). Thus 'I' can spread virtually unhindered across governing domains as long as they are not branching nuclei. Whether this is an effect of the Minimality Condition or perhaps of some other conditions remains to be seen. First, the long vowels in Irish must be subjected to a closer inspection.

Two things, however, force us to think that the immunity of long vowels cannot be sufficiently explained by the Minimality Condition. First, the nature of I-propagation does not seem to be government driven, although the effects of that process might be described as I-licensing. Second, it seems intuitively more appropriate to connect the behaviour of long vowels with the "opaque" short nuclei. In other words, the Minimality Condition may explain the non-interaction in the case of long vowels but it has nothing to offer as far as the immune short vowels are concerned. Additionally, it will be shown that the immunity of long vowels and diphthongs is not overwhelmingly regular.[7] The first instance of an irregularity is presented below.

3.2. **Vowel lengthening before "tense" sonorants**

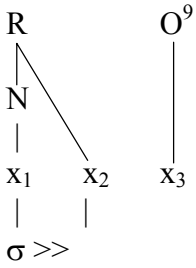
Although there are a few lengthening processes in Irish (Ó Siadhail (1989:49-56)), we will concentrate first on the phenomenon of compensatory lengthening in which the resultant vowel resembles the "Johnsen vowel" (Kaye, Hellan and Johnsen (1990)) which in Irish, as mentioned above, has its source in sonorant geminates (Cyran (1992, 1996a)). First, compare the structures of the "Johnsen vowel" with that of geminates.[8]

[7]One should mention in this context the fact that certain umlaut phenomena in Germanic dialects appear to constitute a glaring counterexample to minimality as both long and short vowels seem to undergo umlaut.

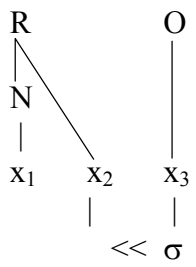
[8]The structure of geminates is reproduced from KLV (1990:217).

(11)

a. *Johnsen vowel*



b. *The syllabic structure of geminates*



A skeletal position cannot be normally governed by two governors. The case of the non-nuclear rhymal position (x_2) constitutes an exception here. Charette (1989:183) argues that this position has to be doubly governed. Thus it is governed by the head of the rhyme (x_1), within the constituent rhyme, and by the following onset (x_3) across constituents (*Coda Licensing*). In Irish, this ambiguous situation - two governors compete for the rhymal complement - results in different effects depending on the context, as is illustrated below.[10]

(12)

[gaun]	*gann*	[gɑn´ə]	*gainne*	"scarce/gs."
[bɑ:r]	*barr*	[bɑrə]	*barra*	"top/pl."
[k´i:l´]	*cill*	[k´il´ə]	*cille*	"churchyard/gs."
[aum]	*am*	[ɑmə]	*ama*	"time/gs.
[baun]	*bonn*	[bonər´ə]	*bonnaire*	"sole/walker"

The "Johnsen vowel" is found when the geminate is followed by an empty nucleus. In Cyran (1992) this phenomenon is attributed to the licensing properties of empty nuclei in Irish. Since the structure of geminates involves an interconstituent governing relation, the head of

[9]The onset is provided here for two reasons. First, according to the Coda Licensing Principle (Kaye (1990)) any rhymal complement (here x_2) must be licensed by the following onset. Second, the inclusion of the onset illustrates the relation between the two structures.

[10]Phonetically speaking the contrast between plain sonorants and geminates is still retained in Donegal and North Connacht Irish. These dialects, however, do not normally exhibit the vowel lengthening in this context which we find in Munster.

this relation, i.e. the onset, has to be licensed to govern.[11] This follows from the Government Licensing principle discussed above in 1.4.1.

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.*

The head of the geminate in Irish can only be licensed to govern by an expressed vowel. Therefore, the non-nuclear rhymal position, which cannot be governed by its non-nuclear head (the onset), is taken over by the rhyme in that the melody from the nucleus is spread onto this position.[12]

Having seen the mechanism of vowel lengthening before such sonorant geminates, let us now look at the qualitative alternations that obtain in these structures. The following data illustrate the case in point.

(13)

a.	[laum]	[liːm´]	[lim´ə]	
	lom	*loim-gs.*	*loime-comp.*	"bare"
b.	[k´aun]	[k´iːn´]	[k´anə]	
	ceann	*cinn-gs.*	*ceanna-pl.*	"head"
c.	[klaun]	[klin´ə]	[klɑnə]	
	clann	*clainne-gs.*	*clanna-pl.*	"children"
d.	[bɑːr]	[bɑːr´]	[bɑrə]	
	barr	*bairr-gs.*	*barra-pl.*	"top"

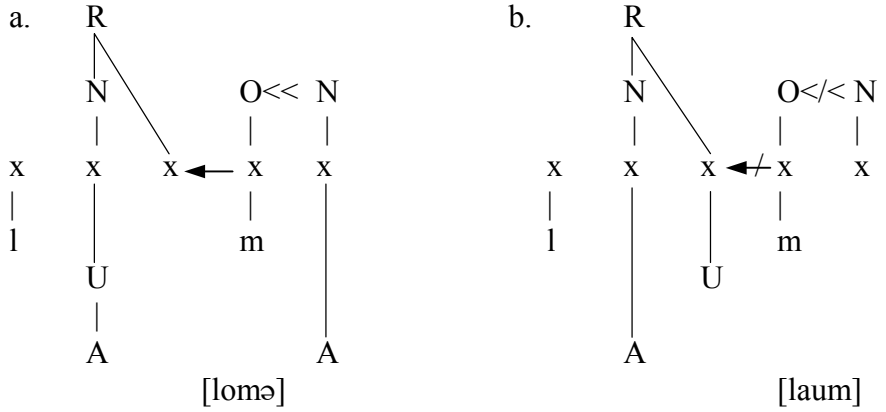
In Munster Irish, the lengthened vowel usually takes the form of a diphthong which, in some cases, can be viewed as decomposition of the vowel in the first nucleus. Before 'r' the lengthened vowel is usually [ɑː].[13] Below, the process of decomposition in the word [laum] ((13)a) is illustrated. The underlying melody in the first nucleus is assumed to be [o] (cf. [lomə] *loma* "bare-npl.").

[11]In fact, in the case of geminates it is proposed in KLV (1990) that there is a relation of proper government between the head of the geminate and the rhymal complement.

[12]Below, the vocalisation of the rhymal complement will receive an alternative interpretation in which the melody of the nucleus need not spread.

[13]See the section on r-sounds (4.2.5) for a possible explanation of this point.

(14)



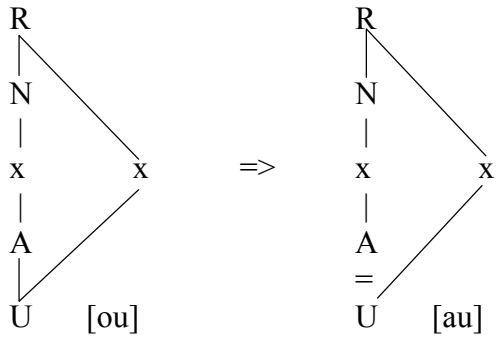
(<<) license to properly govern
(⟵) proper government
(/) absence of relation

((14)) represents the underlying structure of *loma* and *lom*, both of which contain a geminate. The rhymal complement can either be properly governed and not realised as in [lomə] ((14)a) or be taken over by the rhyme and form a diphthong ((14)b). In the former case, the first nucleus remains short. This is possible only when the geminate is followed by a phonetically realised vowel. When the geminate head is followed by an empty nucleus it is not licensed to properly govern, and its complement is "taken over" by the rhyme.

It should be noted that the form [laum] is the result of a fairly recent development in Munster Irish. In most sources, the word is usually transcribed as [loum] (Wagner (1964:268), Ó Cuív (1975:30)). On the other hand Sjoestedt (1931:8) transcribes this word as [laum]. The development from [ou] to [au] can be captured in the following way; in [ou] the element 'U' of the compound (U.A) spreads to the complement, while in [au], 'U' seems to be lost from the nucleus. This is demonstrated below.[14]

[14]These structures were suggested to me by Edmund Gussmann (p.c.).

(15)



There is one problem connected with this analysis. Namely, it involves spreading of the element 'U' from left to right, and we have demonstrated that this element spreads from the right-hand context. One way to account for this complication is to assume that different directionality of spreading is related here to the governing relation within the constituent rhyme, while the familiar cases of U-spreading from the right do not take place under government.

An alternative analysis of *lom / loma* is also available which suggests itself when the form [limˊə] *loime* "bare-comp." is considered. This form clearly indicates that the vowel [o] is susceptible to I-spreading. This, in turn, suggests that this vowel should be represented as (A._) rather than (U.A).[15] If this is the case, then we may not view the diphthong [au] as a decomposed [o]. Additionally, there are other data which show that the element 'U' in the "Johnsen vowel" diphthongs must have a different source than the nucleus. Consider the forms below.

(16)

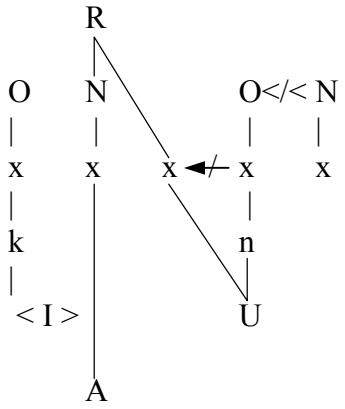
a.	[laum]	or [loum]	/	[lomə]	*lom / loma*	"bare/npl."
	[draum]	or [droum]	/	[dromə]	*drom / droma*	"back/gs."

b.	[kˊaun]	/	[kˊanə]	*ceann / ceanna*	"head/pl."
	[klaun]	/	[klɑnə]	*clann/clanna*	"tribe/pl."
	[gaun]	/	[gɑnˊə]	*gann/gainne*	"scarce/gs."

[15]Recall the case of [sop / sipˊ] as opposed to [kos / koʃ] and the structures for alterable vowels proposed in 2.4.5.

In the case of [laum] and [draum] we can view the diphthong [au] as a result of decomposition (cf. [lomə]). The data in ((16)b), however, show the problem quite clearly. Namely, there are cases where we cannot relate the diphthong [au] satisfactorily to the content of the nucleus because these forms alternate with [ɑ] or [a] rather than with [o]. So decomposition cannot be the source of this diphthong. It may be proposed that the element 'U' in [au] of [k´aun] and [laum] and in [ou] of [loum] has its local source in the velarised sonorant geminate. Consider the structure below.

(17)



[k´aun]

The domain final nucleus is empty and it cannot license the head of the preceding geminate to properly govern its rhymal complement. The element 'U' is present in the melodic make-up of the velarised geminate. This phenomenon can be understood as a result of the identification of the rhymal complement by the geminate head, and seems to support this analysis in that this identification is exactly what is expected in the case of a non-nuclear rhymal complement. Recall that the rhymal complement must be licensed by the following onset (*Coda Licensing* (Kaye (1990))).

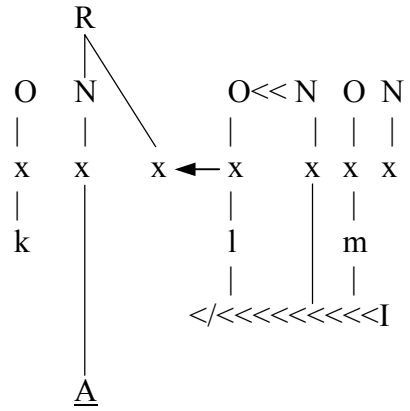
If this analysis is correct, and there is no other local source for 'U', then we have another reason for having this element in the representation of velarised consonants. Recall that [a] is immune to U-spreading, hence the element 'U' can only go as far as the rhymal position (hence [k´aun] and not *[k´oun]).

There is some evidence supporting this analysis. It was mentioned earlier that the "Johnsen vowel" interacts with consonants in the same way as short vowels do. This is hardly surprising given the structure of the vowel. This, among other things, also means that in some cases the vowel [ɑ] will not interact with the following palatalised consonant. Recall the examples like [bɑn´ə] *bainne* "milk" or [bɑl´ə] *baile* "home" where no I-propagation

takes place. The structures below illustrate two possible outcomes when the vowel involved is [ɑ] and the following geminate is palatalised.[16]

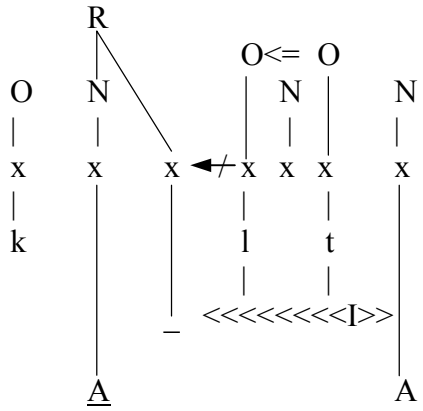
(18)

a.



[kɑl´im´] *caillim* "I lose"

b.



[kɑil´t´ə] *caillte* "lost"

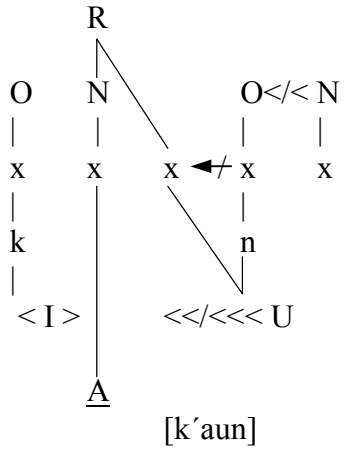
Thus the non-interacting [ɑ] remains intact in [kɑl´im´] as it did in [bɑl´ə]. When the head of the geminate is licensed to govern the rhymal complement, this complement remains unrealised in Irish. On the other hand, when the head of the geminate cannot govern its complement it is taken over by the rhyme (in a metaphorical sense). In [kɑil´t´ə], the element 'I' cannot spread onto the nucleus because we are dealing with the non-interacting "opaque" [ɑ] here too. However, it remains linked to the rhymal complement yielding the diphthong [ɑi]. Notice that this is exactly what happens in [k´aun] where there is no other local source for the element 'U' in the diphthong than the following sonorant, and also the 'U' could not affect [a] in [k´anə] because the nucleus is headed. In other words, the whole pattern of vocalic modifications observed in short nuclei is basically maintained in the case of lengthened vowels of the "Johnsen vowel" type.

[16] In *caillte* we are dealing with interonset government which in Irish overrides the Government Licensing principle (Cyran (1996a)). Normally, in a word-medial situation an empty nucleus which directly follows a governing domain - in this case a sonorant geminate - has to be realised in order to government license the head of the geminate to govern its complement. If, however, the following onset is homorganic with the head of the geminate they may contract a governing relation. The second onset must be followed by an expressed vowel. In this case, the head of the geminate cannot govern its complement because it is not licensed to do so, the reason being that the following nucleus is now trapped in the interonset relation and cannot be realised. This results in lengthening of the preceding nucleus. See Cyran (1992, 1996a) for details.

Thus [kɑlˊimˊ/ kɑilˊtˊə] *caillim / caillte* "I lose / lost" corresponds to [kɑt / kɑtˊ] *cat / cait* "cat/gs.", while [kˊaun / kˊanə] *ceann / ceanna* "head/pl." is analogous to the facts observed in [fˊar / fˊirˊ] *fear / fir* "man/gs." in two ways. First, the front [a] (as in [fˊar]) remains immune to U-spreading both in [kˊanə] and in the case of the compensatorily lengthened vowel, i.e. [au]. Second, the front [a] has been shown to be affected by I-spreading ([fˊirˊ]). Thus we should expect A-suppression when the front [a] is affected by palatalisation in the genitive form of "head" which additionally exhibits lengthening. Recall that the susceptibility of [a] (as opposed to [ɑ]) to I-propagation was tentatively ascribed to an OCP effect. Compare again *ceann*, where [a] is opaque to U-spreading (as in *fear*), but not to I-spreading in *cinn* "head-gs" (cf. *fir*).

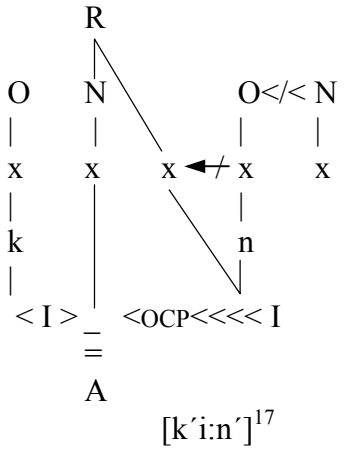
(19)

a.



[kˊaun]

b.

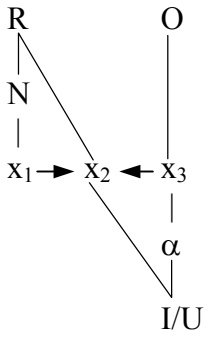


[kˊiːnˊ][17]

Thus, the structure of the "Johnsen vowel" accounts for two things. First, it allows us to understand the mechanism of vowel lengthening before the "lengthening" sonorants. And second, it explains neatly that the vocalic alternations involved in these forms are merely a repetition of the regularities already established on the basis of short vowels. This stresses the need to postulate the structure of the "Johnsen vowel" in the phonological representation of Irish, the relevant portion of which is represented below.

[17]Given just the surface alternation [au / iː] in *ceann / cinn* one might be hard put to account for such an alternation especially since the predominant pattern, found with other [au] diphthongs, is different (see Cyran (1995) and section 3.3.3).

(20)



The interpretation of this structure is conditioned and depends on whether the rhymal complement is properly governed (licensed as in [k´anə] *ceanna*) or not ([k´aun] and [k´i:n´]). This in turn depends strictly on the nature of the nucleus which follows the onset head.[18] One should bear in mind, however, that this structure is not an exact copy of the vowel proposed by Johnsen and differs in two respects. First, the rhymal complement (x_2) is not created metrically, but rather, it is present in the underlying representation of Irish sonorant geminates. And second, the melodic content which is realised under (x_2), i.e. in cases of compensatory lengthening, is not provided by the nucleus (x_1) but by the onset head (x_3). In this respect, the Irish response to the "Johnsen vowel" is a pure instance of a compensatorily lengthened vowel.[19]

3.3. Long vowels and diphthongs: distributional restrictions

The "Johnsen" vowel, as we have seen, need not constitute a counterexample to the general claim that long vowels are immune to element spreading. Given that it is underlyingly short, the astonishing alternations in which this form participates, e.g. [k´aun / k´i:n´] *ceann / cinn* "head/gs.", are not only unsurprising but in fact expected. Thus, having excluded the set of data involved in the phenomenon of vowel lengthening before certain sonorants from our

[18]An alternative proposal to the one presented here assumes that Irish sonorant geminates form interonset governing domains rather than rhyme-onset ones (Bloch-Rozmej (1994)).

[19]This synchronic instance of compensatory lengthening as diphthongisation is in agreement with the proposals put forward in de Chene and Anderson (1979).

analysis of phonologically long vowels, we may now turn to the problems concerning the latter group.

The greater freedom of long vowels to occur in different contexts is explained by the general immunity of long vowels to I-propagation, which, as suggested earlier, may be accounted for by the notion of headedness of certain short, and most of the long, vowels, or by means of the *Minimality Condition* (Charette (1989)). However, in the light of examples showing that I-propagation cannot be treated as a direct instantiation of internuclear government, because we would have to accept government over a governing domain, the effect of this condition in Irish will also have to be revised, especially, that there are exceptions to the generalisation that long vowels are immune to palatalisation, and as will be seen below, these exceptions are of a regular nature. In what follows we concentrate on the effects of I-spreading, which are more spectacular than those of U-spreading, as has been shown in the discussion of short vowels.

3.3.1. **Munster [e:]: composition and decomposition**

Let us now consider some intriguing phenomena which are practically the only productive alternations in Irish involving true long vowels. The data in ((21)) are taken from Ó Siadhail (1989) and display the regular [iə / e:] alternation which is common to practically all dialects.

(21)

[gr´iən]	/	[gr´e:n´ə]	*grian / gréine*	"sun/gs."
[k´iəl]	/	[k´e:l´ə]	*ciall / céille*	"sense/gs."
[kl´iəv]	/	[kl´e:v´ə]	*cliabh / cléibhe*	"chest/gs."
[iəsk]	/	[e:ʃk´]	*iasc / éisc*	"fish/gs."
[m´iən]	/	[m´e:n´ə]	*mian / méine*	"desire/gs."

It should be noticed that the [iə/e:] alternation takes place in a well defined context, i.e. [iə] occurs between a palatalised and a velarised consonant (C´-C). On the other hand, this diphthong corresponds to [e:] when both flanking consonants are palatalised (C´-C´). Notice that the process takes place regardless of whether the palatalised consonant is followed by an inflectional vowel or not (cf. [gr´e:n´ə] vs. [e:ʃk´]).[20]

[20]There are exceptions to this phenomenon (e.g. [bl´ən´] *bliain* "year") which are rather marginal.

The question is how to treat these alternations, assuming that [e:] should be represented as a branching nucleus. The data in ((21)) might suggest that it is the diphthong [iə] which is underlying and that it becomes [e:] when the following consonant is palatalised. In fact, this assumption seems to be correct for a variety of reasons. First of all, one should note the pandialectal character of this phenomenon, i.e. [iə/e:], while in Munster there is a separate phenomenon whereby a long [e:] has to be modified in the same context, i.e. in C′-C, and the result is [ia].[21] Secondly, [e:] is regularly found in the C′-C context outside Munster, which suggests that [iə], although restricted to this particular context, is not derived from [e:].

Let us assume then that the diphthong [iə] in ((21)) is indeed underlying and undergoes monophthongisation when the following consonant is palatalised, while [ia] is derived from [e:] in Munster exactly in the context in which [iə] occurs, i.e. C′-C. Since [e:] is allowed in the C′-C′ context, there will be no decomposition of [e:] in that context, or in fact in any other context except C′-C.[22]

The data below illustrate this typical Munster development where an otherwise long [e:] is realised as [ia] if the following consonant is not palatalised (Ó Siadhail (1989:62), Ó Cuív (1975:25), Sjoestedt (1931:104)).

(22)

[m′iar]	/	[m′e:r′ə]	*méar / méire*	"finger/gs."
[ian]	/	[e:n′]	*éan / éin*	"bird/gs."
[ʃk′ial]	/	[ʃk′e:l′]	*scéal / scéil*	"story/gs."
[b′ial]	/	[b′e:l′]	*béal / béil*	"mouth/gs."
[f′iar]	/	[f′e:r′]	*féar / féir*	"grass/gs."

Although most of the velarised consonants quoted in the context C′iaC are coronals, this need not be a condition for the replacement of [e:] by [ia]. Ó Cuív (1975:25) mentions also

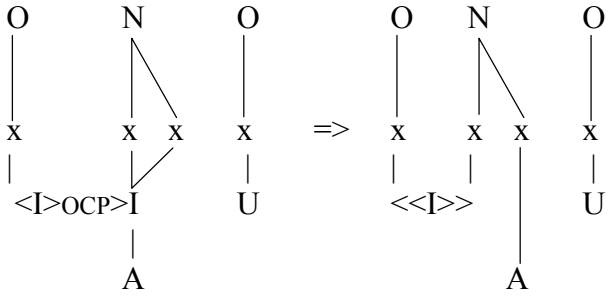
[21]The symbol [ia] is used here to represent this diphthong, following Ó Cuív (1975), although it has to be treated as a convention of phonetic transcription rather than the actual phonological form. (Ó Siadhail (1989) and Sjoestedt (1931) transcribe this diphthong as [i:ə]). It is important to note that [iə] and [ia] are contrastive in Munster, e.g. [iəd] *iad* "they" contrasts with [iad] *éad* "jealousy".

[22]Ó Cuív (1975:16) quotes forms like [bi'd′e:l] *buidéal* "bottle" where the C′-C context is removed from the word-initial position, and words in which the following consonant is [χ], e.g. [dr′e:χt] *dréacht* "part", where [e:] can appear in Munster Irish.

forms with a velar and labial consonant ([iag] *éag* "death", [p´r´iav] *préamh* "root").[23] On the other hand, it seems that the physical presence of a velarised consonant is crucial in the transition to the diphthong [ia] as it does not occur in word-final position (unlike [iə], see [d´iə / d´e:hə] *dia / déithe* "god/pl." in 3.3.5).

Schematically we may represent the decomposition of [e:] to [ia] in the following way.[24]

(23)



The decomposition of [e:] may be viewed as an OCP effect whereby the element shared with the preceding onset cannot spread to the second position in the nucleus. This account, however, is far from satisfactory as it does not explain why the element 'A' remains linked only to the second position or why 'U' is required in the following onset. Thus, it appears that we seem to be dealing with two different [e:]'s in Munster; one of them results from fusion (composition) of [iə], while the other decomposes into [ia].

Let us first look more closely at the [iə] / [e:] alternation ((21)) and the distribution of these sounds in Irish. As mentioned above, this alternation does not only concern the Munster dialect.

3.3.2. **The [iə] contexts**

The most productive context for [iə] is the one presented in ((21)), namely, between a palatalised and a velarised consonant (C´-C). This diphthong can also occur quite regularly in

[23]Nonetheless, this observation has to be borne in mind when the segmental make-up of coronals is analysed in chapter 4.

[24]This analysis is problematic in that the resulting structure of the diphthong [ia] seems to be disallowed in GP (see below).

two other phonetic contexts, i.e. word finally after a palatalised consonant (C´-) e.g. [d´iə] *dia* "god", and word-initially before a velarised consonant (-C) e.g. [iəsk] *iasc* "fish". In the latter case the diphthong [iə] is preceded by an empty onset with which it "shares" its palatalisation element. Formally, the empty onset need not be associated with the element defining palatalisation (which is also the case with consonants which resist palatalisation (cf. [ri])).[25] Furthermore, evidence will be offered which shows that at least in some cases the word-final [iə] may be followed by a phonetically empty onset which is realised in some contexts.[26]

((24)) summarises the contexts mentioned above.

(24)

a.	iəC	[iəd]	*iad*	"they"
		[iəsk]	*iasc*	"fish"
		[iəl]	*iall*	"thong"
b.	C´iə	[b´iə]	*bia*	"food"
		[d´iə]	*dia*	"god"
		[f´iə]	*fia*	"deer"
c.	C´iəC =	((21))		
		[gr´iən]	*grian*	"sun"
		[k´iəl]	*ciall*	"sense"
		[kl´iəv]	*cliabh*	"chest"

[25]Recall the discussion of the licensing options of the "shared" element which involve a situation in which such an element may be associated with both "partners", i.e. onset and nucleus, as in [b´i] *bith* "existence", or only to one of them e.g. [g´ulə] *giolla* "servant" (with the onset), or [iəd] *iad* "they" (with the nucleus). The "shared" element may also remain unlicensed by any of the partners, as in [oχir´] *eochair* "key", in which case the element 'I' shows up by associating with the onset of the preceding definite article e.g. [ən´ oχir´] (see also 3.4.1 for more details concerning these options.).

[26]To illustrate this point the alternation [d´iə / d´e: / d´e:hə] *dia / dé / déithe* "god/gs./pl." may be mentioned. This exhibits the same latent [h] as the monosyllabic forms like [l´a / l´ehə] *leath / leithe* "half/gs" discussed in chapter 2.

In ((21)) we saw that in the case of [gr´iən] the diphthong [iə] is monophthongised if the following consonant is palatalised. The alternation with [e:] is found with some words of the ((24)a,b) type too.

(25)

a.	[iəsk]	/	[e:ʃk´]	*iasc / éisc*	"fish/gs."
	[iəl]	/	[e:l´ə]	*iall / éille*	"thong/gs."
b.	[d´iə]	/	[d´e:]	*dia / dé*	"god/gs."

The three contexts summarised in ((24)) are identical from the phonological point of view. Word initial empty onsets are defined for 'I' or 'U' quality regardless of the fact that these elements may not be physically associated. The word-final context (C´iə) is problematic in this light as there seems to be no consonant following the diphthong which can be said to account for the monophthongisation in [d´iə / d´e:]. Recall that [e:] cannot be decomposed to [ia] in this context, which suggests that the physical presence of a velarised onset following [ia] is required. It is not certain if the same can be said about [iə] as there are some data which suggest that this diphthong is not truly final.

Consider the following data which in fact resemble the monosyllabic forms containing a latent [h], e.g. [b´i / b´ahə] *bith / beatha* "existence" and [l´a / l´ehə] *leath / leithe* "half/gs.".[27]

(26)

[d´iə] nom.	[d´e:] gs.	[d´e:hə] pl.	*dia*	"god"
[b´e:] nom.		[b´e:hə] pl.	*bé*	"maiden"
[kl´iə] nom.		[kl´e:hə] gs.	*cliath*	"hurdle"

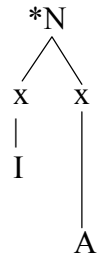
The condition for the final [h] to appear is that it has to be followed by an expressed nucleus. There is no vocalic inflectional ending to fulfil this condition in the nominative and genitive case of "god" ([d´iə / d´e:]), and the case contrasts are expressed by palatalisation alone

[27]The actual phonological representations illustrating the alternations [d´iə / d´e: / d´e:hə] are provided in the following section where a formal structure for [iə] is proposed.

which is responsible for the [iə/e:] alternation (cf. [gr´iən / gr´e:n´ə] ((21))). Only in the plural form is the [h] licensed due to the inflectional ending (parallel to [b´ahə]).[28]

We have decided that [iə] is underlying. The question is, however, what structure should be ascribed to this diphthong. Since it alternates with [e:], one might be inclined to postulate a branching nucleus, in which case the contrast between [e:], [iə] and [ia] would be difficult to represent, as the formal structure of a branching nucleus does not offer enough flexibility to accommodate both [iə] and [ia]. Additionally, a branching nucleus containing 'I' as the head and 'A' as the operator under the right hand side position ((27)) does not appear to be possible. This, in standard GP, used to be expressed by the ban on structures in which a charmless segment governs a positively charmed one (cf. KLV (1985)). Now that we are not taking charm into account, the same restriction may follow from the impossibility of a headless object governing a headed one.[29]

(27)



At any rate, such phenomena as composition of [iə] to [e:], and especially the decomposition of [e:] to [ia], are not typical of branching nuclei, a behaviour which Munster [e:] features with a vengeance.[30] Thus we need to take a closer look at the structure of long vowels in Irish, bearing in mind that if [iə] and [ia] are shown not to be subsumed under a branching nucleus then we have to say the same about [e:]. On the other hand, if we give up the idea that long [e:] is a branching nucleus, how will this fact impinge on the whole vocalic system, and on the structure of pure long vowels in particular?

---

[28]It must be stressed that the latent [h] may not be treated as part of the plural ending. One reason for this is the fact that this consonant appears also when the genitive marker is added e.g. [kl´e:hə]. Additionally, it is claimed that this consonant was still pronounced in word final position (as part of the stem) at the beginning of this century (Sjoestedt (1931:50)).

[29]Recall that the elements 'I' and 'A' are allowed to combine into an A-headed object in Munster, i.e. (I.A).

[30]Recall, for instance, the inaccessibility of branching nuclei to I-spreading in Korean (3.1.2).

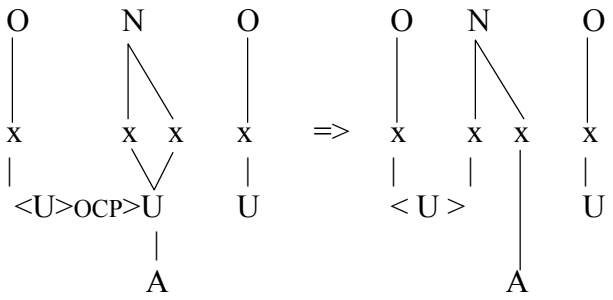
The first thing that strikes us is the fact that from the distributional point of view [iə] is highly restricted and may only appear in the C´-C context, a restriction which does not tally with the facts about pure long vowels (except [e:]). A change of one parameter concerning the quality of flanking consonants will render the structure contrastive. Namely, if the following consonant is palatalised, then we get [e:], and when the preceding onset is not palatalised, then we get [uə].

In the following section we discuss the correspondence between the two diphthongs [iə] and [uə] in the hope of revealing their structures.

3.3.3. **The [iə / uə] parallelism**

We have seen that the diphthong [iə] can alternate with [e:]; parallel to that we might expect [o:] to decompose to [uə] following a velarised consonant. Our discussion raised the possibility that velarised consonants (at least in Munster) contain the element 'U'. Recall that [o:] is a compound containing 'U' and 'A'.

(28)



[o:] > [uə]

((28)) shows what we would expect in the case of [o:], parallel to the alternations involving [e:]. Such structures do not arise too often, and alternations between [o:] and [uə] can only be found in the form of variants of pronunciation rather than as a productive process (Ó Siadhail (1989:64)).[31]

[31]In a sense, this situation should not be surprising, recall that the "shared" 'I' exhibits a stronger influence on headed objects than 'U' (cf. the fronting [ɑ]>[a] in *fear*, or [ɑ:]>[a:] in [br´a:] *breá* "fine".).

(29)

	MUNSTER	CONNEMARA	
mór	[muər]	[mo:r]	"big"
nua	[no:]	[nu:]	"new"
fógra / fuagra	[fo:gərə]	[fuəgrə]	"notice"
cnósach / cnuasach	[kno:səχ]	[knuəsəχ]	"collection"

Although the existence of such inconsistent variants is not devoid of significance, we have no grounds to treat their occurrence as due to a synchronic process. Nevertheless, as in the case of [iə], the context in which [uə] can be found is also subject to stringent restrictions.

The phonetic distribution of [uə] is parallel to that of [iə]. The two diphthongs are in complementary distribution to the effect that [uə] can only follow a velarised consonant, although, in contradistinction to [iə], it can be followed by a palatalised consonant, too.[32] The effects in the latter context are quite intriguing.

(30)

uəC´	[uɪg´]	*uaidh*	"from him"
	[uɪr´]	*uair*	"time"
uəC	[uəsəl]	*uasal*	"noble"
	[uən]	*uan*	"lamb"
Cuə	[buə]	*bua*	"victory "
	[ruə]	*rua*	"red-haired"
CuəC´	[kluɪn´]	*cluain*	"meadow"
	[fuɪm´]	*fuaim*	"sound"
CuəC	[muər]	*mór*	"big"
	[buəχəl´]	*buachaill*	"boy"

[32]The second member of the diphthong followed by a palatalised consonant is a mid to high vowel [ɛ] (Sjoestedt (1931:105)) or [ɪ] (Wagner (1964:32)). Sjoestedt compares the sound to German *ä* in *tätig*. Both transcriptions try to reflect the fact that we are dealing with a reduced (schwalike) sound which is coloured by 'I'. Here we will use the symbol [ɪ] to better illustrate the difference between the [uə] followed by a velarised onset and the one affected by palatalisation.

The similarity between [iə] and [uə] is obvious. In both cases the first element is conditioned by the type of the consonant it follows. This can be summarised in the following way.

(31)

C´iə	*C´uə
Cuə	*Ciə

It is striking that the restrictions concerning the occurrence of [iə] and [uə] are parallel to those concerning the nuclei in apparent monosyllables, e.g. [b´i] and [pu] discussed in 2.1.6. Note also that these restrictions are reminiscent of what we observed about short [u] and [i], i.e.:

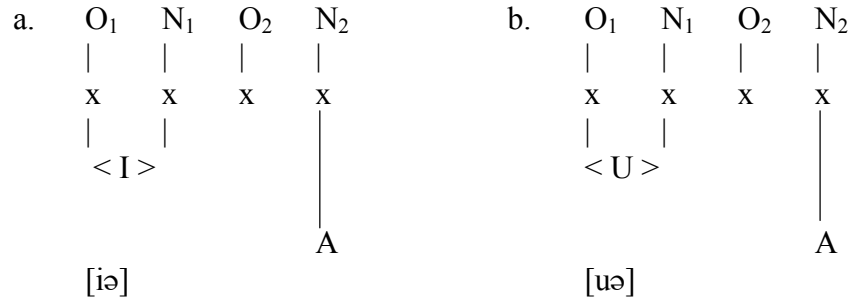
(32)

*C´u C´	e.g. [m´ik´] *mic* "son gs."	*[m´uk´]
*C i C	e.g. [muk] *muc* "pig"	*[mik]

For the time being let us disregard the material following the diphthongs. The affinity of the two diphthongs is obvious and the fact that their distribution is mutually exclusive cannot be ignored. It seems peculiar that their occurrence should be so highly conditioned, especially if [iə] and [uə] are to be subsumed under branching nuclei. Recall that not only can long [u:] follow a palatalised consonant (cf. [k´u:n´] *ciúin* "quiet") but also the short [u] can do so, e.g. [m´un] *mion* "small"; when U-spreading is involved. Why should the first element of [uə] be prevented from occurring when preceded by a palatalised onset? The same can be said about the diphthong [iə]. We have words where [i:] can follow a velarised consonant e.g. [ti:] *tuí* "straw". On the other hand, when short [i] is taken into account, then phonetically it can follow a velarised consonant, again, only if it results from I-spreading e.g. [kid´] *cuid* "part".

All this suggests that the first elements of the diphthongs [iə] and [uə] must be treated as independent short nuclei, or independent of the rest of the diphthong, while clearly the first elements of [iə] and [uə] are dependent on the type of preceding onset. Thus, provisionally, we may suggest the following structures.

(33)



For the purpose of clarity we ignore the possibility that O_2-N_2 might share 'I' or 'U'. However, this point will be addressed below as it appears to constitute a problem for the proposed *Sharing Condition*.[33]

In the structures above, the first nucleus seems to be as directly dependent on the preceding onset as in *bith* and *puth*. Therefore this part of the diphthong should be treated as a separate nucleus. This entails the presence of an empty onset (O_2) to separate the first element of the diphthong from the second one. Let us assume that the empty onset contains a position. We may now look at further similarities and differences between [iə] and [uə] which are manifested in the behaviour of the second part of the diphthongs. It has been shown that [uə] has a broader range of occurrence than [iə] as far as its phonetic distribution is concerned, in that it can be followed by a palatalised consonant. Recall that in such cases [iə] is realised as [e:].

This claim has to be made more specific. [uə] can be followed by a palatalised consonant but this does not remain without effect on the ultimate phonetic shape of that diphthong. As opposed to the [iə/e:] alternation, where spreading of 'I' integrated the melodic expression, 'I' propagation in the case of [uə] results in further strengthening the distinction between both elements of the diphthong. Some more data are supplied below (Sjoestedt (1931:105)).[34]

[33]Recall that every O-N governing domain is defined by the presence of 'I' or 'U' in Irish. One exception to this condition seems to be empty nuclei (2.4.5).

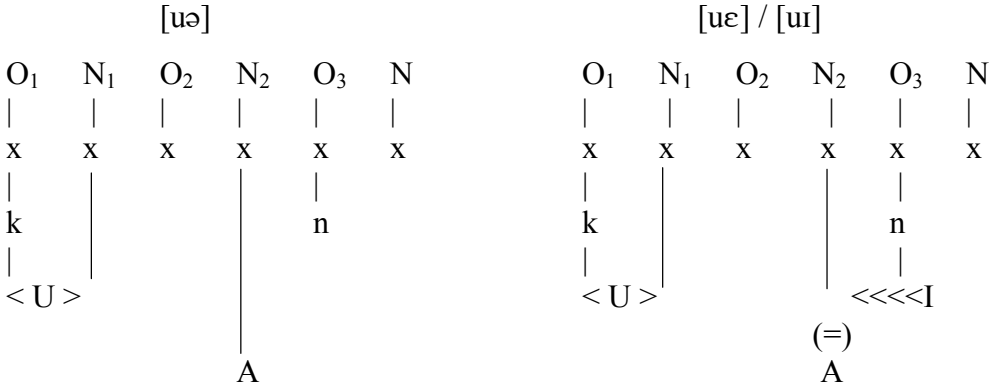
[34]Sjoestedt (1931:105) transcribes the second element of the affected diphthong as [ɛ]. We assume that [ɪ] is equally correct (see the discussion below).

(34)

[buələ]	/	[buɪl´im´]	*bualadh / buailim*	"beat V.N./1st.sg"
[kuən]	/	[kuɪn´]	*cuan / cuain*	"harbour/gs."
[kruəχ]	/	[kruɪh´ə]	*cruach / cruaiche*	"stack/gs."
[uəsəl]	/	[uɪʃl´ə]	*uasal / uaisle*	"noble/pl."
[uən]	/	[uɪn´]	*uan / uain*	"lamb/gs."

The diphthong [uɪ] in ((34)), which is followed by a palatalised consonant, shows that the second element of the diphthong is treated as an ordinary short vowel. Thus the element 'I' is spread from the following palatalised consonant and affects the nucleus. The restrictions concerning the first element of [uə] and the behaviour of the second element in palatalised environments clearly show that these are separate nuclei, and support the suspicion that we are not dealing with a phonological diphthong, or even with a branching nucleus here. ((35)) shows a possible representation for the data in ((34)) based on the assumption that [uə] is a sequence of two separate nuclei.

(35)



(=) optional suppression?

The structures in ((35)) involve an empty onset with a position. In 3.4 below, we will look at processes which show clearly that such a structure is not only acceptable but in fact quite common in Irish. In the word-medial situation as in ((35)) we have to assume that the onset O_2 must be followed by a phonetically expressed vowel (Charette (1991:92)). Here, this

vowel contains the element 'A' which is postulated on the basis of the [iə / e:] alternation,[35] as well as on the basis of the effects of palatalisation of [uə], i.e. [uɛ/uɪ]. Below, a slightly modified structure of the centring diphthongs is proposed.

3.3.4. **The representation of [uə]**

What is most interesting about the diphthong [uə] when affected by palatalisation is that the 'I' does not spread across to the first nucleus in [kuɪn´], which should be the case as there is no buffer element present in the above structure except for the one shared between O_1 and N_1. The question is what prevents the palatalisation from further propagation.[36] Let us first concentrate on the nucleus N_2.

If [ɛ] is the phonetic reflex of the melody subsumed under N_2, (Sjoestedt (1931:74) compares that sound to German *ä* as in *tätig*), it may mean that the element 'A', which is underlyingly present in that nucleus, combines with the incoming 'I'. Such a situation is not predicted in our analysis because a nucleus which contains 'A' and is affected by I-spreading normally loses that element e.g. [f´ar / f´ir´] or [sop / sip´].

This observation should be particularly applicable to such reduced (schwalike) vowels as the second portion of [uə] which are viewed as headless due to their prosodically weak position. On the other hand, the element 'I', which normally is licensed as the head of affected nuclei (hence the suppression of 'A'), need not be viewed as being the head of the second element in [uɛ] for the same reasons, namely, due to the prosodically weak position of N_2. In this case, the combination (I.A._) (and the reflex [uɛ]) may be considered legal, and the difference between [uɛ] and [uɪ] lies in the amount of melodic material that a weak position such as N_2 may license (bear). At any rate, once we agree that N_2 is affected by palatalisation

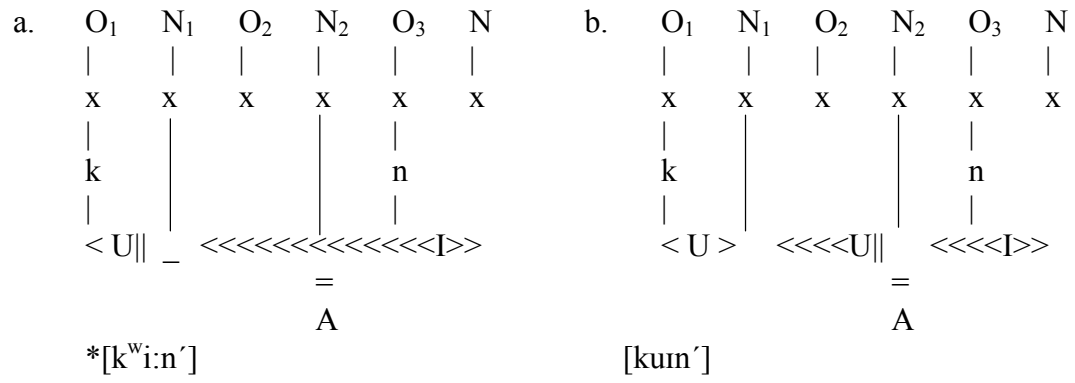
[35]For [e:] to be derived from [iə] we must assume that the element 'A' is underlyingly present in the diphthong. Otherwise, no source for that element is available.

[36]Clearly, the empty onset (O_2) does not constitute a barrier here. Recall the case of palatalisation of the definite article in [ən´ oχir´] *an eochair* "the key", where the element 'I' does spread across an empty onset (more such cases are discussed in 3.4.1).

then we may not blame it for blocking further spreading of 'I' in the structure proposed above, unless we postulate that N_2 shares the element 'U' with the preceding onset.[37]

The structure ((36)a) shows the expected application of I-spreading in *cuain* "harbour/gs." given the structure of [uə] proposed so far, while in ((36)b) the buffer element is assumed to be underlyingly shared between O_2 and N_2.

(36)



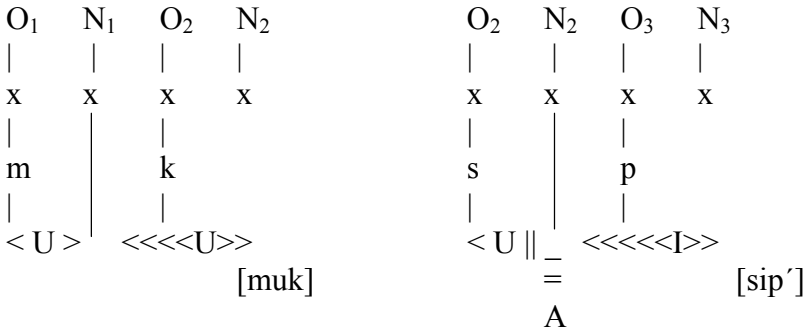
Thus, what should take place in ((36)a) is a "long distance" spreading due to which N_1 should be affected, while O_1 should remain velarised thanks to the shared (buffer) element 'U'. This would be exactly analogous to the alternation [pu / pʷihə] *puth / puithe* "breeze/gs.", where in [pu] the N_1 shares 'U' with the onset, while in [pʷihə] N_1 is affected by I-spreading. Thus, the structure proposed for [uə] in ((36)a) does not exclude the possibility of deriving an ungrammatical form.[38]

To prevent such an unwelcome outcome, it seems that we should postulate that O_2-N_2 share the element 'U' which would block I-spreading in the correct way and in the right place ((36)b). Note that the portion $O_1N_1O_2$ of ((36)b) is analogous to [muk] *muc* "pig", while $O_2N_2O_3$ is exactly what we have in [sip´] *soip* "wisp/gs.".

[37]Recall that a headed (A) blocks I-spreading e.g. [bɑn´ə] *bainne* "milk". In the case of headless nuclei it is the "buffer" element, shared between the onset and the nucleus, that stops further spreading e.g. [pu / pʷihə] *puth / puithe* "breeze/gs."

[38]The alternation [iə / e:] seems to support the view that long distance spreading is possible here, as will shortly be demonstrated.

(37)



There seem to be additional arguments in favour of the structure proposed above in ((36)b) in that it allows for a range of different interpretations, all of which seem to be attested. Let us inspect some of them.

Ó Cuív (1975:105) notes that in pretonic position the front [a], which appears in C´-C, is raised to [i], a phenomenon which does not surprise us in the least given other phenomena where the element 'A' is lost. What is interesting to us here is that the nucleus is realised as [i], i.e. it is a reflex of the element shared with the preceding palatalised onset.

(38)

[g´i'rɑ:n]	*gearán*	"complain"
[k´i'to:g]	*ciotóg*	"left hand"
[f´i'do:g]	*feadóg*	"whistle"

A similar loss of 'A' in pretonic position is found in Cois Fhairrge Irish (Ó Siadhail (1989:39), de Bhaldraithe (1945:15)). Note that in velarised contexts the resulting vowel is [u].

(39)

a.

[b´i'rɑ:n]	*bearrán*	"nuisance"
[l´i'dɑ:n]	*leadán*	"burr of a teazle"

b.

[gu'bɑ:ʃt´ə]	*gabáiste*	"cabbage"
[u'nɑ:l´]	*anáil*	"breath"
[sku'dɑ:n]	*scadán*	"herring"

The loss may be understood in the following way. When the nucleus loses the active element, it is realised as a vowel corresponding to the element "shared" with the preceding onset, i.e. 'I' or 'U'. Hence the pretonic [i] and [u] in these forms. Recall that this is exactly what we said about forms like [b´i] *bith* and [pu] *puth*. Namely, the nucleus has no other source than the element shared with the onset.

If the diphthong [uə] finds itself in pretonic context, it seems that the same happens to the element 'A' which is underlyingly present in the second nucleus, and - in a parallel manner to the forms above - the 'A' is lost. What we would expect in such a case is that the element which this nucleus shared with the preceding onset would now be realised in place of the lost active element. This is, in fact, what seems to take place in [u:'nɑ:n] *uanán* "froth" (Ó Cuív (1975:100)).

The structure proposed for [uə] may additionally be useful in accounting for the tendency to reduce this diphthong to an ordinary O-N sequence, i.e. a consonant followed by a short vowel. This typically happens in the (uɪC´) context, i.e. when a word-initial diphthong is followed by a palatalised onset. As a result a semivowel [w] or [v] appears in place of the first element of the diphthong and is followed by [ɛ/ɪ] (Sjoestedt (1931:105), Ó Cuív (1975:100)).

(40)

[uɪm´] / [wɛm´] / [vɛm´]	*uaim*	"from me"
[uɪt´] / [wɛt´] / [vɛt´]	*uait*	"from you"
[vuɪl´] / [vwɛl´]	*bhuail*	"he hit"
[nə huɪʃl´ə] / [nə hwɛʃl´ə]	*na huaisle*	"the noble-pl."

The forms presented above exhibit a range of possible interpretations of the structure of [uə]. Below we represent the most dramatic one in which the syllabic structure of the diphthong is reduced by half. However, it seems that all of the possibilities are expressible by employing different association patterns. For instance, in [vuɪl´] the element shared between O_1 and N_1 is physically associated with O_1, while it is linked only to the nucleus in [uɪt´] and [uɪm´]. On the other hand, in [vwɛl´] and [hwɛʃl´ə] no melody is associated with N_1.[39]

[39]Note that the same effects would be hard to represent if we are dealing with a branching nucleus.

(41)

a.

O_1	N_1	O_2	N_2	O_3	N_3
|	|	|	|	|	|
x	x	x	x	x	x
	|		|	m	
< U >		<<<U||		<<<<<<I>>	
			=		
			A		
[uɪm´]/[uɛm´]					

b.

O_2	N_2	O_3	N_3
|	|	|	|
x	x	x	x
|	|	m	
< U||	_	<<<<I>>	
	=		
	A		
[wɪm´]/[wɛm´]			

(= optional?)

Let us now briefly consider the [iə/e:] alternation, assuming that in the diphthong [iə] the element 'I' is shared between O_1-N_1 and O_2-N_2.

3.3.5. **The interpretation of [iə / e:]**

A similar structure to that of [uə] may be proposed for [iə] to explain the fact that [iə] and [uə] exhibit corresponding restrictions and are identical in terms of their syllabic organisation. Despite the structural affinity these forms yield different phonetic results because of substantive differences (the melodic material they contain). We predict that the two structures will behave in a different way with respect to palatalisation spreading from the right, precisely due to the presence of the elements 'I' and 'U' within the diphthongs. The alternation [iə / e:] is presented again below, employing the structure with two successive nuclei. Note that if 'U' were present in this diphthong we could expect a different outcome.

(42)

O	N_1	O	N_2		O	N_1	O	N_2
|	|	|	|		|	|	|	|
x	x	x	x	===>	x	x	x	x
|	|		|		|	|	|
< I >		<<<< I >	|		< I >>	OCP		<<<<<I
			|			|		|
			A				_	<<<<<	A

In this approach the alternation [iə / e:] consists in the spreading of the element 'I' onto the nucleus N_2, which results in the fusion (coalescence) of nuclei N_1 and N_2 to form [e:]. Therefore we might treat this melody integration process as yet another instantiation of the

OCP (for more on vowel fusion see 3.4.2). We stipulate that the element 'A' which is now licensed in two nuclei assumes the role of the head (recall the effects of A-spreading (2.3.4)), and the fused long vowel forms a compound (I.A). The analysis of [kuɪn´] ((36)b) and ((42)) above helps us capture the separateness of elements involved in the phonetic forms of the diphthongs [iə] and [uə].

A few words might be in order concerning the A-spreading in [iə/e:] ((42)), as it seems peculiar that the element 'A' is not suppressed in e.g. [k´e:l´ə] *céille* "sense-gs." (as in [kuɪn´]), but rather promoted to the head position of the fused [e:].[40] It appears that this phenomenon is triggered by palatalisation; however, all that can be offered at this stage by way of explanation is the observation that the palatalisation which affects N_2 has another (possibly crucial) effect on the whole diphthong in that it fuses the melodic material of N_1 and N_2. Thus, the spreading of 'A' may be understood here as a result of that fusion by virtue of which 'A' is licensed in two nuclei (forms a bridge). Being licensed in N_1 and N_2, 'A' is no longer susceptible to suppression.[41]

An additional issue which requires some explanation concerns the directionality of element spreading in the structures presented above. It accords with the directionality of the 'I' and 'A' spreading found in vocalic transitions. On the other hand, the fused nuclei N_1-N_2 may be said to form a governing domain in which the first nucleus (N_1) acts as the head of that domain because it bears stress. If this is the case, then the direction of element spreading (from right to left) remains in disagreement with the expected pattern in GP whereby elements spread from the head to the complement. For example, within a branching nucleus or within a geminate the melody is subsumed under the head and spreads to the complement.[42] The directionality of spreading depends strictly on the position of the complement with relation to the head (the latter is underlined):

[40]It should be remembered that in our analysis the compound *(A.I) is illicit in Irish (see 2.4).

[41]In a sense, this situation resembles the cases of A-support in forms like [sp´el´ə] *speile* "scythe/gs." (2.3.3) in which 'A' in the first nucleus is supported from the second nucleus, or, as we may now put it, 'A' is *licensed* in two successive nuclei.

[42]See KLV (1990:217) for an interpretation of the structure of the geminate.

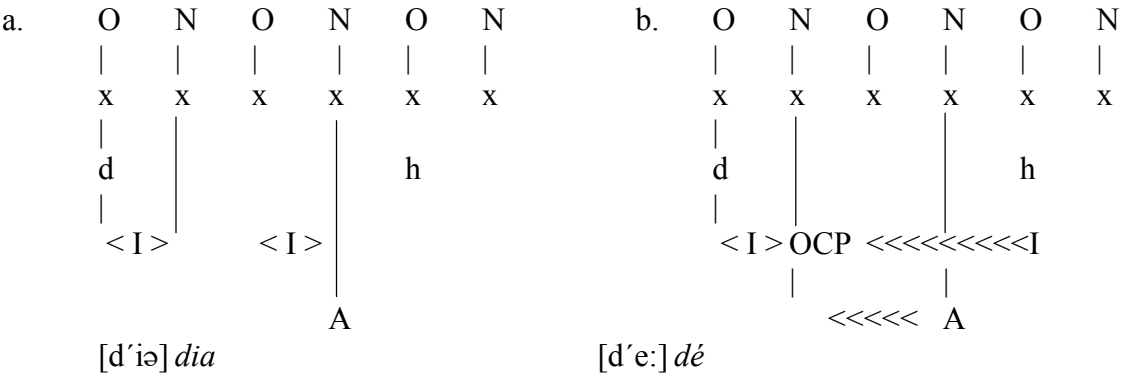
(43) *branching nucleus* *geminate*

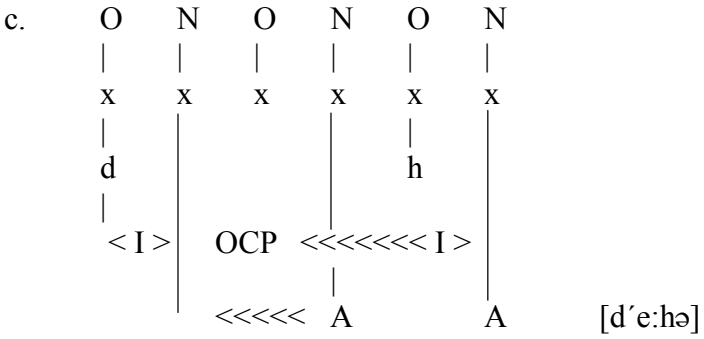
(constituent gov.) (interconstituent gov.)

Note however, that in the alternations [f´is / f´asə] the element 'A' is also spread from the right to the head of domain, i.e. to the stressed nucleus. One way out of the directionality problem is to assume that the N_1-N_2 fusion in [iə / e:] takes place only at the melodic level while at the prosodic level the direction of the internuclear relation is still from right to left, which is a regular situation for an interconstituent relation. Such an interpretation tallies with the facts of vowel harmony in [f´is / f´asə] and the vowel-zero alternations in [uəsəl / uɪʃl´ə] which apply from right to left.

Let us summarise the analysis of the [iə/e:] alternation by providing phonological structures for some data mentioned earlier. If the analysis of the centring diphthongs is accepted, then we are finally in a position to represent structurally the forms [d´iə] nom. / [d´e:] gs. / [d´e:hə] pl. of "god". These forms show that some word-final [iə]'s are followed by a latent [h] as in monosyllabic forms like [b´i / b´ahə] *bith / beatha* "existence/gs." or [l´a / l´ehə] *leath / leithe* "half/gs." The derivation of these forms is given below.

(44)





Let us reiterate what is happening in the forms depicted above. In [d´iə] in structure ((44)a), the diphthong is followed by a latent [h] which we can view as present underlyingly and realised only if the following nucleus is phonetically expressed (cf. [b´i / b´ahə]). In [d´e:] ((44)b), the genitive case is marked by palatalisation alone. Hence, the diphthong is monophthongised to [e:] while [h] is still unlicensed (not pronounced) because the genitive marker does not contain an inflectional vowel.[43] The plural form [d´e:hə] ((44)c) is marked by both palatalisation (hence monophthongisation to [e:]) and an inflectional vowel, therefore the latent [h] may be phonetically realised.

The resulting vowel [e:] may be treated as parallel to the [e] in [d´eʃə] in that it licenses itself by spreading or associating with two positions. The difference between this case and the [e] constructed in [d´eʃə] is that here the spreading becomes possible only if the melody of the two nuclei is fused due to palatalisation and OCP. Alternatively, one might propose that the spreading of 'A' in [e:] provides it with the means to license itself by forming a bridge structure parallel to what happens in the case of short nuclei. Otherwise, this element cannot remain licensed.

If the structures of centring diphthongs proposed here as NON are correct, then the fused [e:] must be treated as a sequence of two nuclei. Does this mean that all [e:]'s are sequences rather than branching nuclei? On the basis of the decomposition of [e:] to [ia] in the (C´-C) context we will argue that this is the case. However, we need to bear in mind the contrast between [iə] and [ia].

[43]Compare the genitive form of [kɑt] *cat* "cat" [kɑt´] *cait* (palatalisation marks the genitive case) with [gr´e:n´ə] *gréine* gs. of [gr´iən] *grian* "sun" in which the genitive is marked by both palatalisation and an inflectional vowel. Clearly, the palatalisation of the final consonant in the genitive is a case of interaction between phonology and morphology.

Let us now see what might be said about the [e: / ia] decomposition and the [iə / ia] contrast.

3.3.6. **Munster [e:]: phonological structure and behaviour**

The alternations [iə/e:] and [e:/ia] are virtually the only productive alternations in Irish involving long vowels. Nevertheless, given that [e:] is not a branching nucleus, what does this tell us about the vocalic system at large?[44] The structures for [iə] and [ia] have to be different because they are contrastive. But it seems that the same process is responsible for the neutralisation of contrast where both [iə] and [ia] are realised as [e:]. This is why the two forms are considered together here. Recall the facts.

(45)

a.	[m´iar]	/	[m´e:r´ə]	*méar / méire*	"finger/gs."
	[ian]	/	[e:n´]	*éan / éin*	"bird/gs."
	[ʃk´ial]	/	[ʃk´e:l´]	*scéal / scéil*	"story/gs."
b.	[gr´iən]	/	[gr´e:n´ə]	*grian / gréine*	"sun/gs."
	[k´iəl]	/	[k´e:l´ə]	*ciall / céille*	"sense/gs."
	[kl´iəv]	/	[kl´e:v´ə]	*cliabh / cléibhe*	"chest/gs."

The data in ((45)a) illustrate decomposition of [e:] to [ia] in the (C´-C) context, while in ((45)b) [iə], which is restricted to the (C´-C) context, becomes monophthongised in (C´-C´). Thus, one should not overlook the fact that despite the phonological contrast the two objects [ia] and [iə], whatever their source, will both have to become [e:] before a palatalised consonant. This points to the affinity of their phonological structures.

It seems that the nature of the decomposition in ((45)a) may be generally outlined as follows. Parallel to the situation encountered in the analysis of short nuclei the elements 'I' and 'A' cannot normally combine. We established that short [e] is either a simplex A-head (A)

[44]One should bear in mind that one exception to the generalisation about the immunity of long vowels to I-propagation has already been identified as the "Johnsen vowel" phenomenon where the vowel is compensatorily lengthened (3.2).

flanked by two palatalised onsets, in which case we are dealing with a phonetic effect (cf. [d´eʃə]), or an (I.A) compound, which tends to be eliminated from the language (cf. [l´et´ir´ / l´it´ir´]). These facts concern mainly the Munster dialect and it is not surprising that it is in this dialect that long [e:] is decomposed. Recall that in Munster the I-head does not license operators as per the LC2 (2.4.4). For this reason in [sop / sip´] *sop / soip* "wisp/gs." the element 'A' is suppressed in the nucleus. On the other hand, in Connemara Irish the two elements may combine as (A.I): hence, the alternation [sop / sep´] as well as the lack of decomposition of [e:] to [ia] in (C´-C) is the norm.

Thus one reason for the Munster decomposition of [e:] to [ia] may be due to the restrictions on element combinations. In other words, one might stipulate that the context (C´-C) causes a redistribution of the compound (I.A) due to, for instance, certain requirements on the status of elements imposed by (C´-C) which are not met in (I.A). Recall that also short [e] cannot appear in this context, but rather, it has to be constructed with the help of palatalisation spreading from the right as well as A-support. In a sense, the two conditions for the short [e] to appear, i.e. I-spreading and A-support, suggest that the vowel has to be constructed "anew". This fact points to the futility of phonemic notions which force us to segmentalise fragments of distinctiveness that are lodged in different positions. It is time to decide what *can* happen to (I.A) in the (C´-C) context.

One hypothesis which can be proposed is that the preceding palatalised onset requires a following I-headed vowel.[45] Given that 'I' does not license operators in Munster Irish, a possible switch from (I.A) to an illicit *(A.I) will automatically have to cause decomposition of sorts. This interpretation would neatly account for the decomposition of [e:] to [ia] in that the element 'I', having become the head of the nucleus N_1 cannot license 'A'. The latter element will then remain linked only to the second nucleus (N_2). Unfortunately, this analysis fails to account for the decomposition of (I.A) to form the phonetic [a] in short nuclei e.g. [l´ak] *leac* "stone".

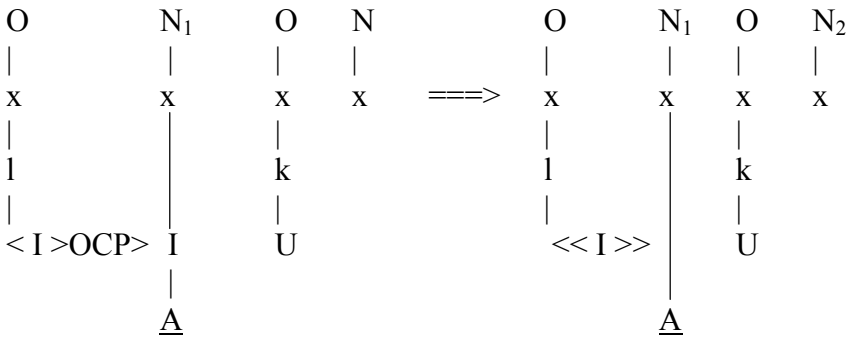
Clearly, if the nucleus were I-headed, then the element 'A' would have to be suppressed according to the LC2 (*'I' does not license operators*). Additionally, in our analysis the preceding palatalised onset provides 'I' to the nucleus as an operator (cf. e.g. [f´is / f´asə]

[45]If palatalised onsets contain 'I' as an operator and require I-head in the nucleus, then this fact is reminiscent of what we referred to as "consonant-vowel harmony" in Polish (2.1.4).

fios / feasa "knowledge/gs." (2.3.4)), and it is the I-spreading from the right which licenses 'I' as the head of the affected nucleus. Hence, in [f´ar / f´ir´] *fear / fir* "man/gs.", A-suppression takes place in the genitive form where the second onset is palatalised, and not in the nominative, where the context is (C´-C).

It seems that one needs an explanation which would answer two basic questions. Firstly, how is (I.A) ([e]) decomposed, and secondly, why is additional I-spreading from the right necessary in order to obtain phonetic [e] or [e:]?[46] If phrased in this way, the questions themselves seem to suggest an interpretation which we can tentatively formulate in the following way: the 'I' operator is "taken away" from the (I.A) compound in the (C´-C) context due to the OCP. In other words, the 'I' of the (I.A) merges with the 'I' shared between the palatalised onset and the following nucleus. Recall that in our analysis of short vowels we found that the shared element is realised in the nucleus only if there is no other active element present or spread. Therefore, the fusion of the two 'I' elements will render the nucleus I-less.[47] Let us first illustrate the mechanism described above on the basis of short nuclei.

(46)



[l´ak] *leac* "stone"

If this interpretation is assumed, then we are able to answer the two questions posed above. Namely, the decomposition of (I.A) in the (C´-C) context involves subtraction of the operator

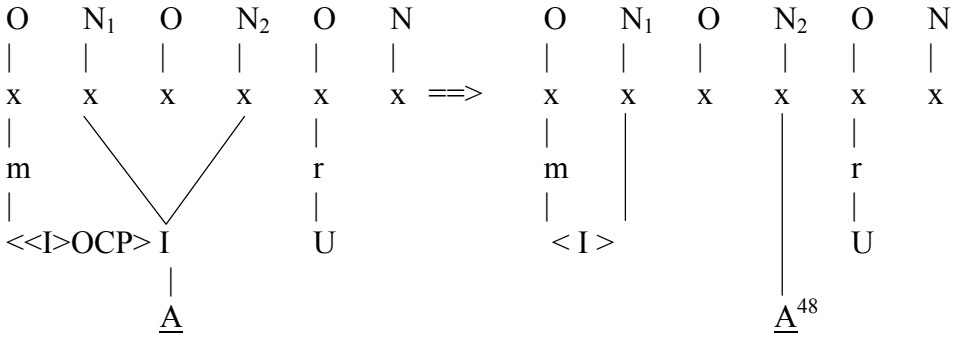
[46]In the case of [e:], one should remember that this object is possible in (C-C) where no decomposition takes place, hence, no I-spreading is necessary, and in (C-C´) where I-spreading is irrelevant because no decomposition occurs after a velarised onset.

[47]This analysis closely resembles the phenomenon of absorption discussed in Smith (1988).

from the nucleus due to the OCP. This in turn, allows us to understand why additional spreading of 'I' from the right is required to derive phonetic [e] as in [l´ek´ə] *leice* "stone-gs.".

If the same analysis is applied to the decomposition of [e:] to [ia] then, the distribution of Munster [e:] becomes clearer. This object is found not only in the (C´-C´) context, but also in (C-C) and (C-C´) e.g. [ge:l] and [ge:l´] *Gael / Gaeil* "Irishman/pl.". Since no decomposition takes place in the last two contexts, because the first onset is not palatalised, whether I-spreading from the right is present or not is irrelevant. The result of the long [e:] decomposition is different from that in a short nucleus in that the element 'I' is realised in N_1, while 'A' remains licensed in N_2. Let us illustrate the decomposition below.

(47)



[m´iar] *méar* "finger"

Here, we are dealing with two nuclei therefore the decomposition takes a slightly different form than in [l´ak]. That is to say, the compound (I.A) is deprived of 'I' parallel to what happens in [l´ak] and only 'A' is linked to N_2. On the other hand the element 'I' is realised in N_1 because that nucleus has no other active element. In a sense, the status of the first nucleus might be said to be identical to that in the diphthong [iə]. One question that might be asked at this stage is why the element 'A' is licensed only in one nucleus rather than in two. It seems that such a structure would, however, neutralise the contrast between the phonological (I.A) as in [m´iar] *méar* "finger" and (A) as in e.g. [m´a:n] *meán* "middle" in the (C´-C) context.[49]

[48]Since we represent the Munster [e:] as (I.A), i.e. an A-headed object, one might expect that the element 'A' should be headed in N_2 parallel to what happens in [l´ak]. If this is the case then this might be one reason why [ia] and [iə] contrast.

[49]Recall that the long [ɑ:] is fronted to [a:] in this context (Ó Cuív (1975:18)).

The problem of [e:] decomposition requires a more in-depth study as the resulting diphthong [ia] is exceptional in many respects, and the tentative interpretation presented above might have to be revised. One advantage of this analysis, however, is that it seems to account for the striking similarity in the behaviour of [e:] to what has been observed about short [e] in Munster, namely, the correspondence between [ia] and [a] in the C´-C context on the one hand, and the alternation [iə/e:] and [a/e] in (C´-C´) on the other. For one thing, both [e] and [e:] are typically found in the (C´-C´) context ([m´e:r´ə] *méire* "finger/gs." and [t´ep´] *teip* "fail"), while neither [e:] nor [e] is regularly found in (C´-C).[50] On the other hand, the fronted [a], typically found in (C´-C) e.g. [l´ak] *leac* "stone", alternates with [e] in the (C´-C´A) context, i.e. when flanked by two palatalised onsets and followed by a nucleus which contains the element 'A'. This alternation resembles the alternation [iə/e:] e.g. [gr´iən / gr´e:n´ə] *grian / gréine* "sun/gs.", in which, the context (C´-C´) plus A-spreading from N_2 to N_1 are also involved.

To summarise: in this analysis the alternations [iə/e:] and [e:/ia] can be accounted for in terms of composition and decomposition of segmental material due to element combinability and the context in which these processes take place.[51] The phonological representation of [iə] and [ia] (and in effect [e:]) proposed for Munster Irish, i.e. a sequence of nuclei rather than a branching nucleus, plays a crucial role in these alternations. The phonological contrast between [iə] and [ia] is claimed to subsist in the status of the element 'A'. That is to say, in [iə] the 'A' element is headless, while in [ia] it is headed. Note that if we treat the vowel [a] in [l´ak] as a decomposed [I.A], then the resulting vowel is also headed, and hence not affected by the 'U' element present in the segmental make-up of [k].

This analysis suggests that [e:] may not be subsumed under a branching nucleus thus we need to investigate the possibility that no long vowels in Irish may have this structure. In the following section we will see how other Irish diphthongs fare in a world dominated by palatalisation and velarisation.

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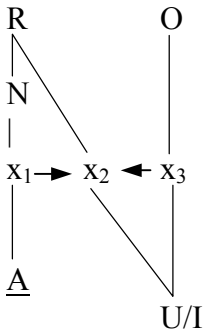
[50]Some exceptions concerning the occurrence of [e:] in C´-C were mentioned earlier, e.g. [bi'd´e:l] *buidéal* "bottle" where the C´-C context is removed from the word initial position, and words where the following consonant is [χ] e.g. [dr´e:χt] *dréacht* "part" (Ó Cuív (1975:16)).

3.3.7. **The [au] / [ai] parallelism**

The disappearance of the old consonantal system resulted in a number of diphthongs in which the second element corresponds to the palatal or velar quality (Sommerfelt (1927)). We will inspect the possibility here that [au] and [ai] are structurally similar to [iə] and [uə] in that they contain an empty onset. It will be claimed that the difference between the two pairs generally lies in the order of elements involved. Specifically, while in [iə] and [uə] the first nucleus is dependent on the quality of the preceding onset and the second contains the element 'A', in [au] and [ai] it is the first nucleus that contains 'A' and the second one is largely dependent on the quality of the intervening onset.[52]

In general, Irish diphthongs are much more generous than pure long vowels in supplying us with clues concerning their structure. In 3.2, we considered a context of vowel lengthening which is one of the sources of diphthongs and long vowels in Irish, namely, the "Johnsen vowel" phenomenon.

(48)



The structure of the "Johnsen vowel" in Irish involves an underlying short vowel (x_1) followed by a sonorant geminate.[53] This form yields a surface short vowel if the geminate (x_2-x_3) is followed (licensed) by a phonetically expressed nucleus e.g. [k´anə] *ceanna*

[51]So far the composition and decomposition analysis unifies the phonological behaviour of the I-A combination in short and long vowels. In chapter 4, we will see that the same phenomenon has its place in the consonantal system of Irish.

[52]See Sjoestedt (1931:61) for a discussion of dependencies between consonants and diphthongs.

[53]The justification of the proposal that we are dealing with a phonological sonorant geminate here can be found in (Cyran (1992, 1996a)). On the other hand, in 3.2. we discuss the similarities and differences between this structure and the original proposal made by Johnsen in Kaye, Hellan, Johnsen (1990).

"head/pl.". On the other hand, when the geminate is followed by an empty nucleus then the rhymal complement (x_2) is vocalised and forms the second element of a diphthong e.g. [au] as in [k´aun] *ceann* "head" when the sonorant is velarised, or [ɑi] as in [kɑil´] *caill* "lose" if the sonorant is palatalised.

Thus, the "Johnsen vowel" is involved in two types of phonological phenomena. One of them, the quantitative alternation, of the type just described e.g. [k´aun / k´anə] *ceann / ceanna* "head/pl.", is dependent on the licensing properties of the nucleus directly following the sonorant geminate, and the lengthening is of compensatory nature. The other phenomenon is dependent on element spreading and refers to qualitative alternations. We have mentioned that the second element of the diphthongs [au] and [ɑi] in [k´aun] *ceann* "head" and [kɑil´] *caill* "lose" is strictly dependent on the U/I specification of the sonorant. However, the most drastic example of a qualitative shift exhibited by this structure is probably the [au / i:] alternation as in [k´aun / k´i:n´] *ceann / cinn* "head/gs.". It has been demonstrated, nonetheless, that such alternations mirror the effects encountered in the behaviour of short vowels to the letter (3.2).

However, the "Johnsen vowel" is not the only structure that can be assigned to the surface diphthong [au] in Irish. There are data which show that certain [au]'s have not only a different distribution, in that they may be followed by non-sonorants, but also that they behave differently with respect to the quality and quantity phenomena described above. For instance, such [au]'s do not participate in quantity alternations (cf. [k´aun / k´anə] with [ʃl´aun´ / ʃl´aunə] *sleamhain / sleamhna* "smooth/pl." (not *[ʃl´anə])), and also, exhibit different effects when followed by a palatalised consonant. Namely, instead of [au / i:] alternation we observe that only the second element of the diphthong is affected. This may be accompanied by glide formation within the diphthong. In ((49)), a short list of words containing [au] before a palatalised consonant is given (Sjoestedt (1931:93-102)).

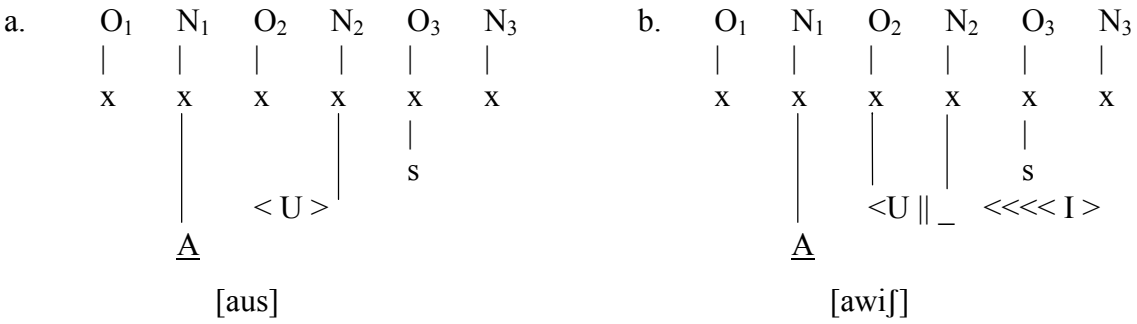
(49)

[awin´]	/	[aun]	*abhainn / abhann*	"river/gs."
[awiʃ]	/	[aus]	*amhais / amhas*	"gs./servant"
[ʃaw^{i}k´]	/	[ʃauk]	*seabhac / seabhaic*	"gs./hawk"
[ʃl´awin´]	/	[ʃl´aunə]	*sleamhain / sleamhna*	"slippery/npl."
[m´awir´]	/	[m´aurəχ]	*meabhair / meabhrach*	"mind/gs."

It is uncontroversial that the diphthong [au] in ((49)) will have to be viewed as having a different structure from the [au] discussed above ("Johnsen vowel"). This time when [au] is followed by a palatalised consonant, the second element of the diphthong forms a glide [wi] or [w^{i}] which, in fact, is analogous to word-initial glide formation in words beginning with the diphthong [uə] discussed earlier e.g. [wɪm´] *uaim* "from me" (cf. Sjoestedt (1931:105) and Ó Siadhail (1989:63)).

Bearing in mind what we found about the centring diphthongs and the specification of empty onsets we are now in a position to describe the data in ((49)), i.e. the glide formation within the diphthong [au] by postulating an internal onset in the structure of this diphthong. Thus the word for "servant" would have the following representations: ((50)a) in the nominative and ((50)b) in the genitive.[54]

(50)



The element 'I' pushes out the element 'U' from the N_2 position in ((50)b) in which case 'U' docks onto the preceding onset O_2. Notice that the glide formation involving O_2-N_2 is parallel to what happens in [muk / m^{w}ik´][55], [wɪm´] and [wɪʃl´ə]. In the case of the diphthong [au], however, this phenomenon is not obligatory, as forms like [auʃ] are common. What is interesting to us here is the fact that we do not get *[aus -> aiʃ].[56] This can be explained by the fact that whenever the second element of the diphthong is affected by palatalisation and as a result 'U' is banned from the nucleus, the 'U' has to dock on the preceding onset (cf.

[54]Note that [aus / awiʃ] shows a similar glide formation to that in [uəsəl / wiʃl´ə] word-initially. This similarity is predicted by the fact that in both cases the structure and the context are the same, i.e. the 'U' shared between O-N, which is "pushed out" from the nucleus by palatalisation, docks onto the onset.

[55]The off-glide symbol is used here for emphasis.

[56]We also have to remember that [au] and [ai] are contrastive. It seems that the contrast lies in the specification of the "diphthong-internal" onset.

[m^{w}ik´]). Thus, assuming that the diphthong [au] forms a sequence of nuclei, the structural parallelism between [awiʃ] and [wɪʃl´ə] seems to be correct.

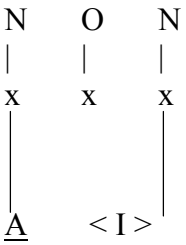
A similar structure to that proposed in ((50)) for [aus] may be assigned to the diphthong [ɑi]. See the data below first.

(51)

[rɑjəd]	[rɑig´ me:]	*raghad / raghaidh mé*	"I'll go"
[fɑjən]	[fɑim´]	*faigheann / faighim*	"he gets/I get"
[gɑi^{ə}r]	[gɑir´]	*gadhar / gadhair*	"dog/gs."
[rɑi^{ə}rk]	[rɑir´k´]	*radharc / radhairc*	"sight/gs."

Note that in the examples given above all diphthongs begin with a velarised onset and in such a context, it will be recalled, a headed 'A' is not affected by palatalisation parallel to cases such as for example [bɑn´ə] *bainne* "milk".

(52)



The structure proposed above, to some extent resembles the derivation of [ɑi] in [kɑil´] *caill* "lose" (3.2) in which the nucleus contains a headed 'A' therefore the element 'I' cannot affect it. However, the form ((52)) does not participate in quantity alternations and has to be represented separately.

Thus it may be shown that almost all Irish diphthongs behave as if they were not branching nuclei but rather a sequence of nuclei. This form accounts for the agreement between consonants and diphthongs which, given their structure, follows from the restrictions and mechanisms observed in the system of short vowels. The study of Munster diphthongs supports the view that the vowels [i] and [u], whether separate nuclei or parts of diphthongs, are very much dependent on the quality of surrounding consonants, or simply, constitute a residue of the quality of lost consonants.

Since most diphthongs do behave like sequences of nuclei, one might propose that all pure long vowels are also sequences, in which case we need to explain their immunity to palatalisation spreading. The behaviour of vowel [e:] in Munster seems to provide clues as to what may be involved. Namely, only a decomposed long vowel, such as [ia], or in fact any diphthong, may interact freely with palatalisation spreading from the right.[57] One reason for that is that the two elements involved in diphthongs are perceived by phonology as single nuclei. It seems that this generalisation holds for most, if not all, Irish diphthongs thus providing a strong argument for abandoning the structure of a branching nucleus from the representation of these vowels. If, however, we want to do the same with the pure long vowels, i.e. propose a structure of fused nuclei (which we, in fact, have already demonstrated to be the case for [e:], then the immunity of pure long vowels to interaction with palatalisation and velarisation should receive a formal explanation.

3.4. The representation of long vowels and diphthongs

So far we have considered three possible phonological forms which yield long vowels or diphthongs. Namely, a branching nucleus, the existence of which, initially assumed without argument, is becoming more and more questionable in Irish; furthermore there is the so called "Johnsen vowel" which results from compensatory lengthening (3.2), and a sequence of nuclei which has been proposed on the basis of the distributional peculiarities exhibited by [iə], [uə] and [e:].

The results of the analysis of the [iə / e:] alternation and the similarity between [iə] / [uə] and [ai] / [au], which led to the establishment of their structures as a sequence of two nuclei separated by an empty onset position, necessitate further investigation of the vocalic system of Irish in terms of phonological structures of long vowels. In particular, more evidence is needed in support of the intervening empty onset.

In this section it will be demonstrated that not only [ai], [au], [iə], [uə], [ia] and ultimately [e:], but also [u:] and [i:] can be assigned the structure of a sequence of nuclei

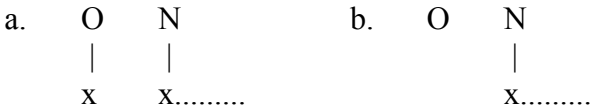
[57]Recall that the decomposition of [e:] to [ia] is itself effected by palatalisation of the preceding onset. However, this is due to the licensing relation between the onset and the following nucleus rather than to spreading.

separated by an empty onset in certain specific contexts. It will appear that the phonological behaviour of such forms dovetails with the rest of the system, e.g. in the stress placement phenomena, which suggests that we are dealing with *the* phonological representation of Irish long vowels. We begin by clarifying some additional points concerning the empty onsets in Irish with respect to their alleged specification for the I/U value.

3.4.1. **Empty word-initial onsets and the I/U specification**

The existence of empty onsets word-initially follows from the theory of government (KLV (1990)), but it is not restricted to this model only (cf. e.g. Clements and Keyser (1983)). Phonological words must begin with an onset even though phonetically it may be null, i.e. it may contain no melodic material. Structurally the existence of empty onsets may take the two forms.

(53)



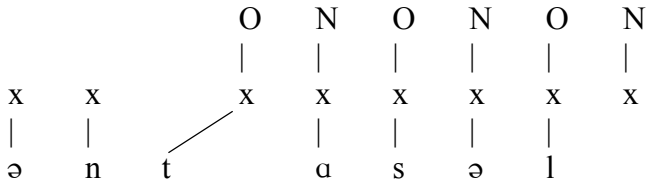
The difference between the structures presented above lies in the presence versus absence of a skeletal point in the word-initial onset. The form in ((53)a) allows us to account for the so called '*h-aspiré*' phenomenon in French (see Charette (1991:92)), as well as for '*t-prefixation*' in Irish. The latter process occurs when masculine nouns beginning with a vowel are preceded by the definite article *an* (Gussmann (1986)). The Irish facts are illustrated below.

(54)

a.	[ən toləv]	*an t-ollamh*	"professor"
	[ən tə'rɑ:n]	*an t-arán*	"bread"
	[ən tar´ig´əd]	*an t-airgead*	"money"
b.	[ən´ t´i:m]	*an t-im*	"butter"
	[ən´ t´iəsk]	*an t-iasc*	"fish"
	[ən´ t´ian]	*an t-éan*	"bird"
c.	[ən tir´i:ʃ'l´u:]	*an t-uirísliú*	"humiliation"
	[ən tiʃk´ə]	*an t-uisce*	"water"

The word-initial empty onset of the nouns in ((54)) supplies a syllabic position for the floating segment of the masculine definite article. This is illustrated in ((55)).

(55)



[ən tɑsəl] *an t-asal* "donkey"

As shown in ((53)b) the empty onset need not have a skeletal position. Such a positionless structure, for example, was proposed by Charette (1991:193) for certain inflectional endings in French. It seems, however, that in Irish the word initial empty onset must have a position. What is more, this empty position is not exactly empty as it has to be specified for either velarisation or palatalisation.

In ((54)) we see that in certain cases the *"t-"* prefixed to masculine nouns as well as the other consonant of the definite article are palatalised e.g. [ən´ t´iəsk] *an t-iasc* "the fish" ((54)b). On the other hand, the two consonants are velarised when the definite article is prefixed to the words in ((54)a) or ((54)c) even though in ((54)c) the vowel which immediately follows the prefix is [i], i.e. a palatal vowel. This means two things. First, the specification of non-nuclear positions (consonants) for either palatalisation or velarisation is independent of the type of vowel they precede, and second, word-initial empty positions must be somehow phonologically specified for one of these values (Gussmann (1986)).

In earlier sections we pointed to certain aspects of consonant specification as regards palatalisation and velarisation. One of the conclusions was that every Onset-Nucleus sequence, which in GP constitutes a licensing domain, is characterised by the presence of an element ('I' or 'U') which is "shared" between the two positions (the *Sharing Condition*).[58] However, as we discovered, the "sharing" does not always entail physical association of the shared element to the onset and the following nucleus. One example in which the shared

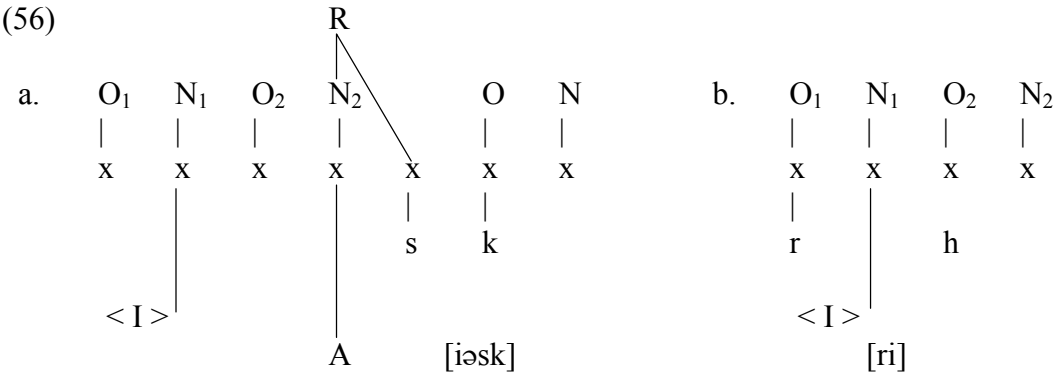
[58]Exceptionally, if the word-medial nucleus is empty, then the element I/U is linked to two successive onsets (see e.g. [soləs / si:l´ɸʃə] *solas / soilse* "light/pl." (2.1.2)). Recall that we assume that domain-final empty nuclei still observe sharing. One possible explanation of the word-medial situation may be the fact that the flanking onsets e.g. [l´] and [ʃ] in [si:l´ɸʃə] are in a governing relation (Cyran (1996a)), hence they must agree as regards their I/U specification.

element is not licensed (associated) in/by the onset is the case of word-initial [r] which resists palatalisation in this position e.g. [ri] *rith* "running". Recall that in such monosyllabic forms the phonetic reflex of the nucleus strictly depends on the quality (I/U) of the preceding onset.

Another obvious case where the element 'I' defining palatalisation is not associated to the onset position is when this onset is empty. Note that an onset which licenses 'I' or 'U' should phonetically correspond to [j] and [w] respectively. Thus, we have to assume that these elements are present but not licensed in the empty onset.

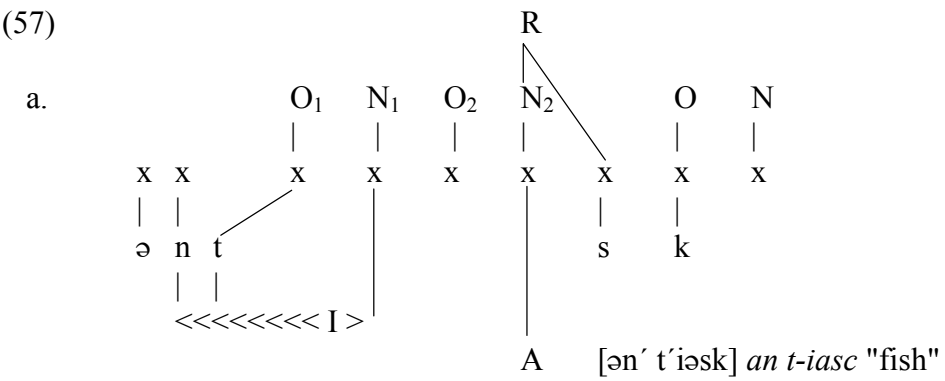
Let us compare the two instances where 'I' is not licensed in the onset, i.e. [iəsk] *iasc* "fish" and [ri] *rith* "running".

(56)

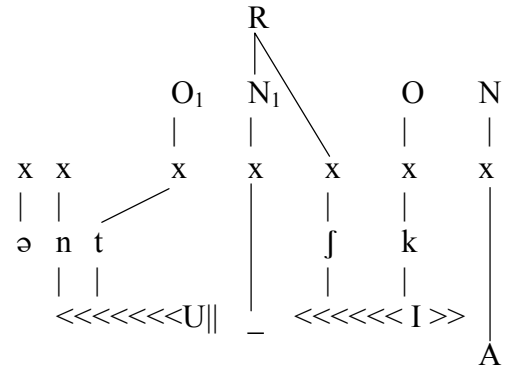


It is interesting that the element 'I' shared between O_1 and N_1 in [iəsk] shows up when the word is preceded by the definite article, in which case, parallel to [ən toləv] *an t-ollamh* "professor", the stem initial empty onset provides a skeletal position for the floating [t] of the article. This time the consonants of the article are palatalised by the shared element 'I' ((57)a). In ((57)b) we provide an example which proves that it is the shared element and not the melody of the stem nucleus N_1 that affects the consonants of the preceding definite article. Note that in ((57)b) the nucleus contains 'I' (hence phonetic [i]) but, unlike in [iəsk], the sharing domain O_1-N_1 is defined by 'U'. Therefore, the consonants of the article are velarised.

(57)



b.



[ən tiʃkˊə] *an t-uisce* "water"

The above structures illustrate two types of the manifestation of the element "shared" between O_1 and N_1 of the stem. Firstly, in both instances the shared element defines the quality of the consonants in the definite article by becoming linked to its onset O_1 when this contains some melody (here: the floating [t]). Secondly, the shared element constitutes a buffer to spreading from the right.

Note that if we just take the lexical form [iʃkˊə] (without the article) then the element 'U', which is shared between O_1 and N_1 is not linked to any of the "partners". Thus, it is not licensed in the nucleus because the nucleus finds itself within the domain defined by 'I'. Likewise, the 'U' is not associated to the empty onset as this would yield [w].

A similar situation can be observed in the behaviour of feminine nouns beginning with a vowel when preceded by the definite article. This time no '*t-prefixation*' occurs but instead the consonant in the definite article is palatalised in certain cases.[59]

(58)

[ən i:hə]	*an oíche*	"the night"
[ən o:gˊə]	*an óige*	"the youth"

but

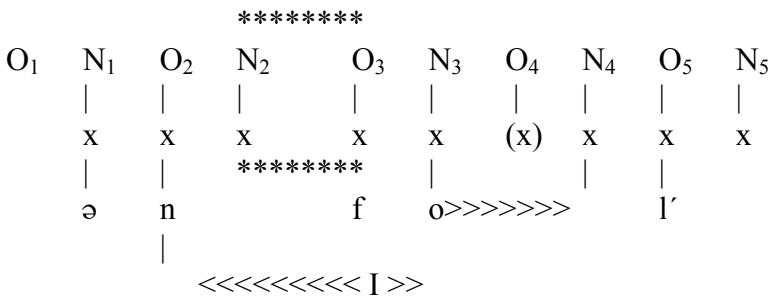
[ənˊ i:k]	*an íoc*	"the healing"
[ənˊ o:lˊ]	*an fheoil*	"the meat"
[ənˊ oχirˊ]	*an eochair*	"the key"

[59]See Gussmann (1986) for a detailed analysis of both 't-prefixation' and palatalisation in Irish.

The above forms clearly show that palatalisation or velarisation of the definite article is independent of the vowel it precedes, as the article may be palatalised when the stem begins with a back vowel (e.g. [ən´ oχir´]), or velarised even if the stem begins with a palatal vowel (e.g. [ən i:hə]).

It is interesting to note what happens when the definite article *an* precedes a noun like [f´o:l´] *feoil* "meat": the onset of the noun is lenited and disappears phonetically but the specification of palatality remains and manifests itself by affecting the preceding consonant of the article. Thus it would be necessary to accept the view that the palatalising or velarising element is not only independent of the quality of the vowels (cf. [ən´ o:l´]), but also of the onset. Notice that when the palatalised [f´] is lenited the element 'I' remains in the phonological structure, but is not associated to the skeletal position of the onset (*[jo:l´]), but rather, palatalises the definite article. This may be due to reduction of the N^2-O^3 sequence of empty positions.[60]

(59)



[ən´ o:l´] *an fheoil* "the meat"

Thus "sharing", it seems, should be understood in a metaphorical sense, and perhaps it would be prudent to replace that notion with a postulation of phonological presence of the elements I/U between every onset and the following nucleus which can take different structural forms.

We may say that lexically the elements I/U are lodged in O-N licensing domains and extend their own domain of application (by spreading or licensing I/U in objects) leftwards, which is manifested in vocalic alternations and the quality of consonants.

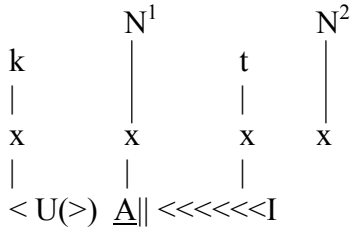
There are two types of barriers delimiting such I/U domains. One of them is a group of headed ("opaque") vowels e.g. [ɑ] in [kɑt´] *cait* "cat/gs.", [o] in [koʃ] *cois* "leg/dat." and long vowels which are headed by definition. Symbolically, we may represent this type of

[60]See Gussmann and Kaye (1993:435) for a similar type of reduction in Polish, and also the well-known cases in French: *le ami* => *l'ami* etc.

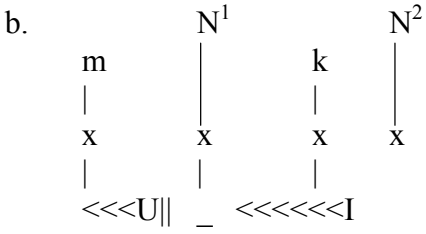
blocking as (A||<<<I/U). The other type of barriers is constituted by the first non-identical element shared by the preceding O-N to which we refer as "buffer" (U||<<<I). One of the differences between the two barriers is that headed vowels prevent I/U licensing in the nucleus, while the buffer element protects the onset. Below we illustrate the two instances of blocking (delimiting) I/U spreading on the basis of [kɑt´] *cait* "cat/gs." and [mik´] *muic* "pig-dat.".

(60)

a.



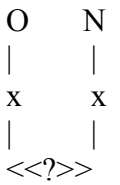
b.



We may now summarise the types of structures, or association patterns, in which the elements 'I' and 'U' defining palatalisation and velarisation of consonants may be involved with respect to the *Sharing Condition* (? = 'I' or 'U').

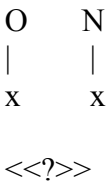
(61)

a. *linked to both*



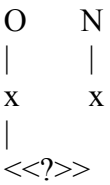
[b´i]
[kru]
[wuəsəl]

b. *linked to none*



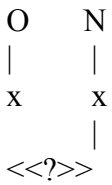
[oχir´]
[i:hə]
[iʃk´ə]

c. *linked to O*



[p´ubər]
[p^{w}ihə]
[wiʃl´ə]

d. *linked to N*



[iəsk]
[ri]
[uəsəl]

The above structures account for most of the facts concerning the consonant-vowel interaction.

((61)a) illustrates cases like [b´i] *bith* "existence", [kru] *cruth* "shape", and [wuəsəl] *uasal* "noble"[61] in which the nucleus strictly depends on the quality of the preceding onset. This, it will be recalled, refers to the monosyllabic forms and the first element of the

[61]This is one of the variant pronunciations of this word. See also [uəsəl] (d), [wiʃl´ə] (c) and Sjoestedt (1931:149) for more cases of glides like e.g. [i mə jiəg´] *i mo dhiaidh* "after me", [ni: fɑdə vuit´] *ní fada uait* "not far from you" etc.

diphthongs [iə] and [uə]. However, it would be wrong to assume that such a "dual" association of the shared element depicted in ((61)a) is limited to the restricted cases only. A similar structure will be found in forms like [muk] *muc* "pig" and [f´ir´] *fir* "man/gs." where the quality of the nucleus agrees with the quality of its onset.

((61)b) depicts the most abstract but attested situation where the shared element cannot be deduced from the quality of the nucleus or the onset (because it is empty), and it is through the influence on the preceding definite article that we learn of the actual representation of such forms. This accounts for such an unexpected outcome as the initial palatalisation of the article when the stem begins with a back vowel e.g. [ən´ oχir´] *an eochair* "the key", as well as for the velarisation of the article in words beginning with a palatal vowel in [ən i:hə] *an oíche* "the night" and [ən tiʃk´ə] *an t-uisce* "the water". In the latter case we assume that the element 'U' is present and blocks palatalisation spreading which, clearly, has affected the nucleus.

Structurally, [ən tiʃk´ə] corresponds to what we have in ((61)c) in that it illustrates how the sharing of 'U' in O-N is upset by I-spreading from the right. The best example of that is [p^{w}ihə] *puithe* "breeze/gs." the nominative of which is [pu] *puth* and belongs to the ((61)a) group. Thus in ((61)c) the shared element is linked only to the onset, while the nucleus is influenced by element spreading from the right. In [p^{w}ihə] and [wiʃl´ə] (variant of *uaisle* "noble/pl.") we have I-spreading to which the shared 'U' forms a buffer, while in [p´ubər] *piobar* "pepper" 'I' forms a buffer to U-spreading.

Finally, ((61)d) is in fact a repetition of ((61)a) in that the specification of the nucleus and the preceding onset is the same except that the onset does not license the shared element because it is empty as in [iəsk] *iasc* "fish" and [uəsəl] *uasal* "noble", or in the case of the word-initial [r] as in [ri] *rith* "running" which resists palatalisation in Irish. We may also add here such vowel-initial forms as [o:g´ə] *óige* "youth" and [i:k] *íoc* "cure" in which, as opposed to [oχir´] *eochair* "key" and [i:hə] *oíche* "night" ((58)), the quality of the shared element agrees with that of the vowel. This is proved by the way the definite article *an* is affected by these forms, i.e. [ən o:g´ə] and [ən´ i:k] (cf. with [ən´ oχir´] and [ən i:hə] ((58))).

Let us now concentrate on the word-medial empty onsets and possible arguments for maintaining the claim that in some cases they must be defined in terms of 'I' and 'U' elements.

3.4.2. **Empty onset word-medially and pure long vowels**

It will be shown here that empty onsets are acceptable in the system of Irish and manifest their presence not only in diphthongs such as [iə]/[uə] and [ai]/[au] but also in the creation of phonetically pure long vowels. So far we have discussed empty onset positions word-initially, while word-medial empty onsets were alluded to in the discussion of [iə]/[uə] and [ai]/[au]. There are other processes which clearly show that such empty non-nuclear positions need to be postulated word-medially. Let us first look at the data.

(62)

['br´ehəv]	/	[br´e'hu:nə]	*breitheamh/breithiúna*	"judge/pl."
['tɑləv]	/	[tɑ'lu:n]	*talamh/talún*	"land/gs."
['oləv]	/	[o'lu:nə]	*ollamh/ollúna*	"professor/pl."
[kosvil´]	or	[ko'su:l´]	*cosmhail* or *cosúil*	"similar"
['gr´anəvər]	or	[gr´a'nu:r]	*greannmhar*	"funny"

In ((62)) we observe an alternation of the type VC(V) >VV which may be viewed as suppression of the intervocalic consonant, and subsequent compensatory lengthening. It should be noticed that the resulting vowel is always [u:]. The shape of this vowel might be treated as a residue of the delinked consonant. In ((62)) it is [v] which contains 'U' (labiality) as the place defining element. On the other hand, we have alternations where the suppression of [v] may result also in the long vowel [i:]. This situation occurs when the intervocalic consonant is palatalised. Therefore it may be proposed that the quality of the fused vowel is contingent not so much on the place defining element of the delinked consonant as on its secondary place specification, i.e. whether it was a palatalised or a velarised consonant (containing 'I' or 'U').[62] The data below illustrate the development of [i:] as a result of the delinking of [v´] and [g´].[63]

[62]Note that this is what happens in [ən´ o:l´] *an fheoil* "meat" in which what remains of the lenited consonant (labial too!) is the element 'I' defining palatalisation. Recall that such an element is a property of the domain of palatalisation rather than of the consonant alone.

[63]It may seem strange that a velar plosive should be liable to deletion on a par with a labial spirant. See, however, Foley (1977:28) for a proposed scale of propensity to spirantisation in natural languages in which the velar plosive features as the most susceptible obstruent. See also chapter 4., in which the weakness of [v] and [g] is correlated with their segmental representation.

(63)

[uv]	/	[i:]	*ubh / uibhe*	"egg/gs."
[n´iv´]	/	[n´i:]	*nimh / nimhe*	"poison/gs."
[t´ig´]	/	[t´i:]	*tigh / tighe*	"house/gs."
[n´ig´]	/	[n´i:]	*nigh / ní*	"wash/V.N."

The quality of the long vowel in ((63)) is determined by the specification of the consonant that is delinked. Below we will attempt to illustrate the derivation of the forms in the [uv / i:] alternation which at first blush looks preposterous as it appears to involve a replacement of everything with a single element 'I'. In fact, all that happens in [uv / i:] is delinking of [v] in intervocalic position parallel to ['gr´anəvər - gr´a'nu:r] except that here the delinked consonant is palatalised in the genitive case, hence, the resulting vowel is [i:] rather than [u:]. Recall that when [f´] was lenited in [ən´ o:l´] *an fheoil* "meat" the element defining palatalisation could not be licensed in the empty onset as this would yield an incorrect form *[ən´ jo:l´]. This point is crucial because, as will be suggested below, the same happens in the case of the lengthened vowel [i:], namely, that the element 'I' is linked to two consecutive nuclei only.

In the structures presented below in ((64)) several assumptions have been made concerning the phonological representation as regards the elements which have the following justification; O_1 shares 'U' with N_1 because the definite article in [ən uv] *an ubh* "egg" is velarised. The derivation of [u] in N_1 ((64)a) is analogous to that in [muk] *muc* "pig" in that it may be understood as a result of U-spreading from the velarised consonant to the right. The multiple occurrence of 'U' under O_2 is used for expository reasons in order to keep the I/U specification of the consonant separate from labiality.[64]

It seems that the actual representation of [v] could not only be reduced to (h.U) but in fact to (U) alone.[65] The reason for this is that the element (h) is normally used to bring out the contrast between [w] and [v] for which there is no need in Irish. Firstly, [w] is not found in

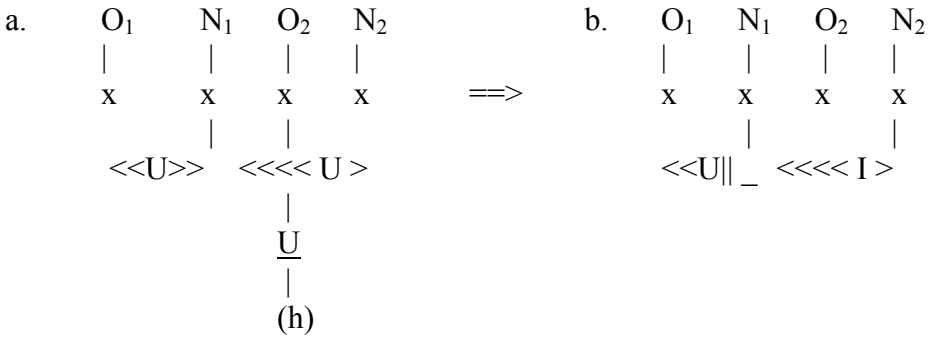
[64]Note that if we left one 'U' to define the velarised labial consonant then the palatalisation of such an object should automatically eliminate labiality. This could be helpful in accounting for the [uv/i:] alternation, however it would wrongly predict that [v´] should be absent from the system (cf. [n´iv´] *nimh* "poison"). Thus, without excluding this interesting possibility, we will use two elements 'U'.

[65]This possibility is fully exploited in chapter 4.

word-final position, and secondly [w] and [v] are to a great degree interchangeable in word-initial position (cf. e.g. [vuɪm´] and [wuɪm´] *uaim* "from me"). In ((64)c), we represent what intuitively appears to be the intermediate stage (i.e. [iv´ə]) in the derivation of [uv/i:] ((64)a,b), which in fact, is a fully legitimate form found outside the Munster dialect (Wagner (1958:45)).

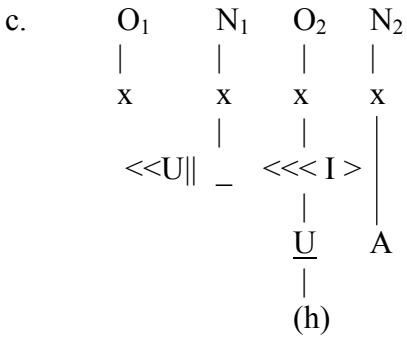
(64)

a. b.



[uv] *ubh* "egg" [i:] *uibhe* "egg/gs."

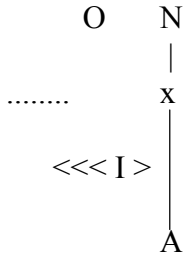
c.



[iv´ə] *uibhe* "egg/gs." (in Connemara and Donegal)

Let us begin with [iv´ə] ((64)c) which, although it is not normally found in Munster, illustrates the relevant factors underlying the derivation of [i:]. The onset O_2 is palatalised in the genitive, hence the element 'I' spreads and affects the first nucleus N_1 in the same manner as in the alternation [muk / mik´ə] *muc / muice* "pig/gs." in which case the 'U' shared between O_1 and N_1 forms a buffer to further spreading. The element 'I' defining palatalisation of O_2 is shared with the inflectional vowel N_2 the structure of which agrees with what we proposed earlier in the discussion of A-harmony, i.e.:

(65)



Thus, in order to derive Munster [i:] ((64)b) we need to account for the suppression of the melodic material from O_2 and of the element 'A' from N_2. It seems that the context for the [v´] suppression can be defined quite clearly. Namely, this consonant, as well as [v] ((62)) and [g´] ((63)), tend to be lost in the intervocalic position, which entails fusion of the flanking nuclei.[66]

Quite a different problem is posed by the presence of 'A' in the inflectional vowel. Note that the sole deletion of the melodic material from O_2 should yield a familiar structure of the centring diphthong [iə] with 'A' lodged in N_2. Thus we need to account for the suppression of 'A' from N_2 in some way. To do that, we may either relax the proposal concerning the make-up of Irish inflectional vowels ((65)) and accept the fact that certain endings have no 'A', or look for a reason why the 'A' is not realised.[67]

There are reasons to believe that such a synchronically derived form as [i:] *uibhe*, which we view as a sequence N_1-N_2 will behave differently from the centring diphthongs [iə] and [uə] in a few respects. First of all, the centring diphthongs are strictly dependent on the quality of the preceding onset (*Ciə, *C´uə), while, as can be seen in the structure ((64)b), [i:] (*uibhe*) is phonologically preceded by a buffer 'U'. Thus the phonological behaviour of the centring diphthongs clearly points to a difference in structure which may be responsible for suppression of 'A' in Munster *uibhe*.

Secondly, we have established that although [iə] is found word-finally e.g. [d´iə] *dia* "god" there are data which suggest that phonologically this diphthong may be followed by an

[66]Recall that without assuming that both flanking nuclei are realised in such forms it would be difficult to account for the regular occurrence of [v], [v´] and [g´] word-finally (see also the discussion of the second conjugation of Irish verbs below which provides an additional argument in favour of our analysis, viz. stress placement with reference to such lengthened vowels).

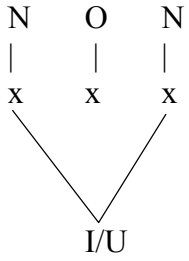
[67]Wagner (1958:45) transcribes the genitive case of "egg" in the Cork area as [i:ᵊ] which might point to the presence of 'A' in these forms.

additional (phonetically null) O-N sequence which shows up when the final nucleus is realised e.g. [d´e:hə] *déithe* "god/pl." (see also [kl´iə / kl´e:hə] *cliath / cléithe* "hurdle/gs." (3.3.2)). Such forms contain the latent [h] which may be phonetically realised only if followed by a realised nucleus (recall [b´i / b´ahə] *bith / beatha* "existence/gs.").

One may propose that this additional (phonetically mute) O-N sequence could be understood as a condition underlying the existence of word-final [iə] so that a centring diphthong must be followed (licensed?) by another nucleus, whereas in [i:] ((64)b) N_2 containing 'A' is not followed by another O-N sequence hence 'A' must be suppressed.[68] Another fact which might support this interpretation is that word final diphthongs, not only [iə] and [uə] but also [ai] and [au] are rare in Munster. Additionally, the word-final short vowels which follow a palatalised onset, tend to be raised to [ɪ] in Irish, i.e. they tend to lose 'A' e.g. [fɑ:l´t´ɪ] *fáilte* "welcome", [ag´in´ɪ] *aigne* "mind", [bɑn´ɪ] *bainne* "milk", etc. (Sjoestedt (1931:93)). All these points do not entirely account for the suppression of 'A' from N_2 in Munster *uibhe*, but they allow us to believe that such an outcome is possible.

Thus, intuitively one may accept the derivation of [i:] from [uv] as licit where the syllabic structure of the long (lengthened) vowel is ((66)).

(66)



The phenomenon of consonant delinking and vowel lengthening described above as nuclear fusion appears to be pervasive in the verbal system of Irish. Certain verbs of both first and second conjugation have the vowel lengthened in this way. Additionally, verbs of the second conjugation exhibit stress shift onto the lengthened vowel parallel to ['gr´anəvər / gr´a'nu:r].

[68]This last point refers strictly to the notion of interaction between prosodic and autosegmental licensing which in the case in hand means that the nucleus N_2 may autosegmentally license only certain amount of melodic material if it is not prosodically licensed by another nucleus. A similar phenomenon is considered in Yoshida (1992) where it is proposed that long vowels in certain languages must be followed (licensed) by another nucleus.

(67)

I CONJUGATION

	IMPERATIVE		1ST PERSON SG.		
	[lɑs]	*las*	[lɑsim´]	*lasaim*	"light"
	[kir´]	*cuir*	[kir´im´]	*cuirim*	"put"
but	[n´ig´]	*nigh*	[n´i:m´]	*ním*	"wash"
	[sig´]	*suigh*	[si:m´]	*suím*	"sit"

II CONJUGATION

	IMPERATIVE		1ST PERSON SG.		
	['k´anig´]	*ceannaigh*	[k´a'ni:m´]	*ceannaím*	"buy"
	['air´ig´]	*éirigh*	[ai'r´i:m´]	*éirím*	"get up"
	['k´u:nig´]	*ciúnaigh*	[k´u:'ni:m´]	*ciúnaím*	"calm"

The first person singular is formed by adding the marker [-im´] which once more shows that the consonant to be delinked finds itself between two realised nuclei. Note that the stress shift similar to that in ['gr´anəvər / gr´a'nu:r] can be observed, which suggests that fused nuclei behave exactly like other long vowels. Particularly instructive here are the forms [k´u:'ni:m´] and [ai'r´i:m´] in which the stress falls on the second long vowel. This perfectly agrees with the stress placement pattern found in Munster.

In this dialect stress assignment is to a large degree quantity sensitive (e.g. Loth (1913), Gussmann (1994)). The basic patterns of stress placement depend on whether the vowels are short (v) or long (v̄) and are given below.

(68)

a.	'v v	['sɑgərt]	*sagart*	"priest"
b.	'v v v	['skol´ənə]	*scoileanna*	"schools"
c.	'v̄ v	['ko:tə]	*cóta*	"coat"
d.	v 'v̄	[kɑ'l´i:n´]	*cailín*	"girl"
e.	v̄ 'v̄	[prɑ:'ti:]	*prátaí*	"potatoes"

Words containing two or three short vowels are stressed on the first syllable, while the last two examples show that the second nucleus always attracts stress if it is long. Notice what

happens in verbs of the second conjugation where the first syllable contains either a long vowel or a heavy diphthong and where the same type of nuclear fusion as in the first conjugation is observed. The stress in [k´u:'ni:m´] and [ai'r´i:m´] is shifted to the second syllable to fit the pattern shown in ((68)e).

From the point of view of the system of stress placement, a sequence of fused nuclei behaves exactly like other long vowels, which suggests that the difference between the two structures, if there is any, is irrelevant. The important point here is that the fused vowel, i.e. an underlying N-O-N is made equal to what we may still believe to be a branching nucleus as regards stress placement. Thus, without jumping hastily to conclusions, we may bear in mind the possibility that our Irish long vowels might be nothing else than N-O-N's.

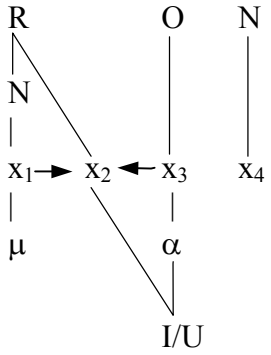
Thus, it appears that not only [iə], [uə], [ai] [au] and [e:] but also certain [u:]'s and [i:]'s may be shown to have the representation of a nuclear sequence in Irish rather than a branching nucleus. If on that basis, we want to propose that all long vowels in Irish are sequences rather than branching nuclei, we need to account for the integrity that other pure long vowels (except [e:]) exhibit. By integrity, we mean the general immunity of long vowels to element spreading despite the fact that, structurally, they may be formed by two short nuclei. This problem will be taken up below, but first, let us say a few more words about compensatory lengthening.

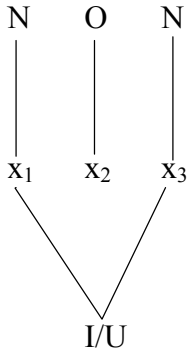
3.4.3. **Digressions on compensatory lengthening in Irish**

Perhaps this is the right place to drift slightly away from the frenetic activity of establishing different phonological structures for long vowels and try to clarify certain aspects concerning the predictions that such constructs entail. Specifically, the nuclear fusion discussed in the previous section is clearly a second instance of compensatory lengthening that we encounter in Irish.[69] The first example of this phenomenon that we considered was the lengthening of the "Johnsen vowel" type ((69)a). Let us compare the two processes in terms of their structure and behaviour.

[69]The use of the term "compensatory lengthening" here is metaphorical as it agrees with the traditional concept in terms of the general mechanism only - lengthening as a result of consonant loss - while structurally, we are dealing with nuclear fusion.

(69)

a. 

b. 

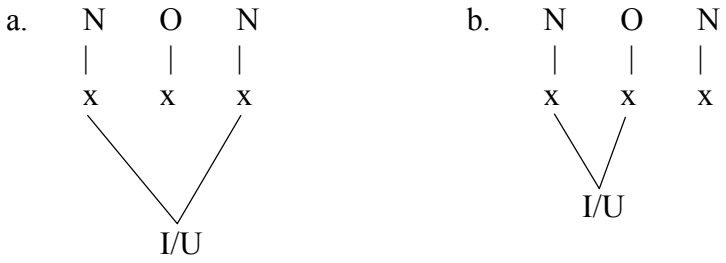
[k´aun / k´anə] *ceann / ceanna* "head/pl." [uv / i:] *ubh / uibhe* "egg/gs."

The interpretation of the structure ((69)a) is conditioned by and depends on whether the rhymal complement (x_2) is properly governed (licensed as in [k´anə] *ceanna*) or not (as in [k´aun]). This in turn depends strictly on the nature of the nucleus (x_4) which follows the onset head (see 3.2 for details), i.e. on whether it is realised or not. On the other hand ((69)b) involves deletion of an intervocalic consonant (onset) which yields a vowel constituted by two consecutive nuclei where the requirement seems to be that the second nucleus (x_3) be realised phonetically. Thus both distributional (behavioural) and structural differences between the two types of compensatory lengthening are clear. It will be shown below, and in the following section, that these discrepancies have their phonological consequences.

If we consider the segmental make-up of the lengthened vowels we see that the "Johnsen vowel" predominantly takes the form of a diphthong (e.g. [k´aun]), but pure vowels are also possible (e.g. [k´i:n´] *cinn* "head/gs."). On the other hand, the nuclear fusion seems to yield only pure [i:] and [u:]. Let us now concentrate only on the lengthening of the ((69)b) type.

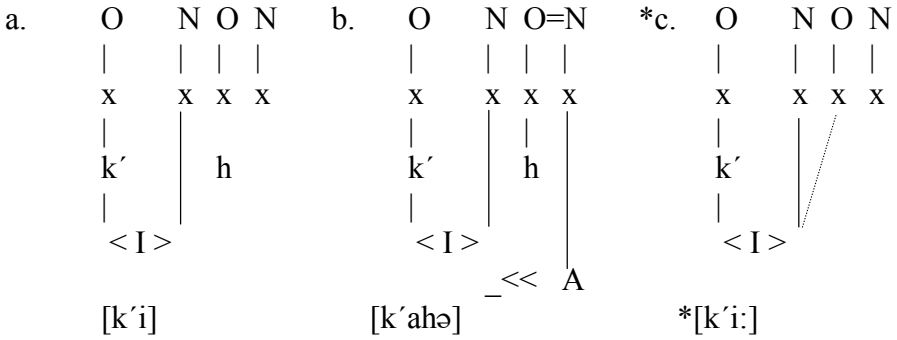
The remark concerning the mechanism of nuclear fusion that we want to make here concerns the prediction that our analysis of this type of compensatory lengthening in Irish carries. Recall that the condition that has to be fulfilled here is that the second nucleus be realised, hence we prefer to represent the lengthened vowel as ((70)a) rather than ((70)b) below. In other words, we predict that a mere deletion of the final consonant will not result in compensatory lengthening in Irish.

(70)



One case where this prediction is borne out concerns the forms with the latent word-final [h] e.g. [k´i / k´ahə] *cith / ceatha* "shower/gs.". This consonant shows up when the following nucleus is realised phonetically. On the other hand, when the final nucleus is empty (licensed by parameter) the consonant is not licensed "to exist".[70] See the structures below.

(71)



(=) prosodic licensing, (<<) spreading

The structure ((71)c) shows what we should expect given that final consonant delinking is allowed to cause compensatory lengthening. On the other hand, if we adopt the view that the final nucleus must be realised for lengthening to occur (cf. [uv /i:] in the previous section), then we account for two things: firstly, [k´i] is not compensatorily lengthened because the final nucleus is licensed by parameter, i.e. it is mute, and secondly, the [k´i] situation illustrates the typical course of action, i.e. the reduction of inflectional endings in languages, where the first segment to go is the final nucleus (becomes licensed by parameter) and then the final consonant may be lost without necessarily entailing compensatory lengthening.

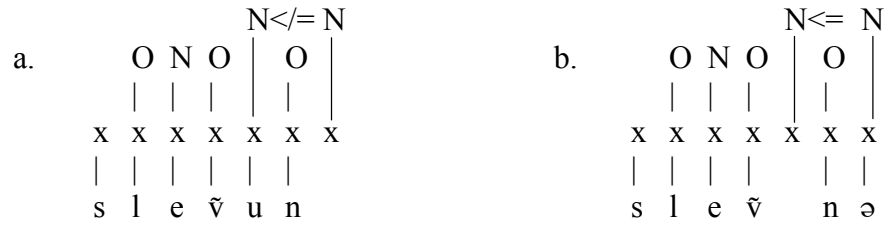
Another prediction that this analysis makes is that consonantal loss word-medially will drastically differ from the word-final situation in that the lengthening will take place

[70]This is a case of interaction between autosegmental and prosodic licensing whereby a position can autosegmentally license melodic material ([h]) only if it is itself prosodically licensed by the following realised nucleus.

regardless of whether the lost consonant is followed by a realised or licensed nucleus.[71] Below we concentrate only on the type of lengthening which results in a nuclear sequence and try to account for the discrepancy as regards the word-final and word-medial situation.[72]

The Old Irish word *slemun* "smooth" had a plural form *slemna* (Thurneysen (1949:118)) in which case we may speak of vowel syncope, or in GP terms, Proper Government by which the nucleus which directly follows *"m"* (phonetic [ṽ]) is licensed by the inflectional vowel, hence empty. A hypothetical representation of the two forms is given below.

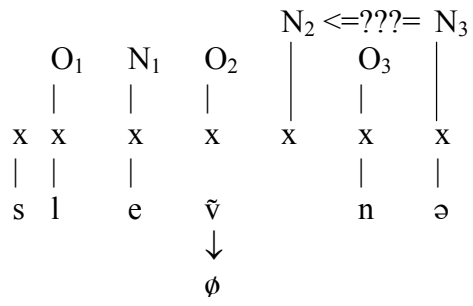
(72)



(<=) Proper Government, (</=) no Proper Government

What is important here is that the consonant [ṽ] is phonologically sandwiched between two nuclei. The question now is why the deletion of the consonant [ṽ] caused compensatory lengthening which is reflected in the present day forms [ʃlʹaunʹ / ʃlʹaunə] *sleamhain / sleamhna* "smooth/pl.". We expect no lengthening (as in [kʹi]) because the nucleus directly following the deleted [ṽ] is licensed. See below.

(73)



[71]An additional condition here is that such a language needs to possess quantity contrasts in the system already (de Chene and Anderson (1979)).

[72]For a "textbook" example of a compensation as a result of rhymal complement loss see the development [niχt > ni:t > nait] in the history of English (e.g. Harris (1994a:35)).

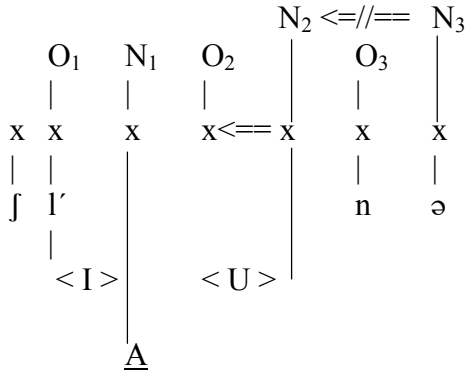
If we want to maintain the strict view on compensatory lengthening that it can only occur if both nuclei are realised when an intervocalic consonant is lost, then we have to assume that, for some reason, the nucleus N_2 has to be realised in this context, i.e. it cannot be properly governed.

It seems that we may account for this problem quite easily. It was mentioned earlier in this chapter that empty onsets must be properly governed, and thus obey the same principles as empty nuclei (Charette (1991:193)).[73] Charette (1991) proposes that such empty onsets are properly governed by the following realised nucleus, thus, a sequence of two empty positions O_2-N_2 (word-medially) is impossible and the nucleus must be realised, or else, such a sequence must be truncated. In other words, we are dealing here with a conflict between the licensing duties that the nucleus must discharge (properly govern the onset) and the fact that it itself may be properly governed by the following nucleus. A similar conflict of principles in French is discussed in Charette (1991:104) where a properly governable nucleus must be phonetically realised in order to license the preceding governing domain. The outcome in Irish seems to be identical to that in French. That is to say, the nucleus is realised in order to discharge its licensing (governing) duties.

Thus what happens in Irish is that when the melodic material lodged in the O_2 position is delinked then the following nucleus can no longer be properly governed because it itself has to properly govern the preceding empty onset. If this analysis is correct, then the connection between consonant loss and compensatory lengthening of the inter-nuclear type word-medially follows automatically from the general principles defining phonological structure. We illustrate this below and introduce the necessary changes in order to reflect the present day form and to be able to account for the melodic shape of the resulting diphthong. Namely, the 'U' element which constitutes a residue of the lost consonant (be it labiality or velarisation which we represent as U-ness).

[73]See the discussion of the phonological Empty Category Principle in 1.3.

(74)



(<==) Proper Gov., (<=/=) no Proper Gov.

Note that ((74)) gives precisely the representation of the diphthong [au] which was proposed in 3.3.7. The element 'U' which has the ability to spread leftwards will not however affect 'A' because 'A' is headed (cf. [l´ak] *leac* "stone"). Thus it seems that the strict view of the possible types of compensatory lengthening in Irish may be maintained. What is more, it would be interesting to be able to correlate the discrepancy between word-medial and word-final context as regards lengthening with the virtual absence of word-final diphthongs in Irish.

Let us now address the question of immunity of pure long vowels assuming that their structure is that of a sequence of nuclei. The assumption is based on the findings concerning [e:], [i:] and [u:] (this chapter) as well as on the conviction that there is no reason why the formal (syllabic) structure of pure long vowels in Irish should be different from diphthongs.

3.4.4. **Fused nuclei and the question of immunity**

We have seen that, apart from the cases where underlying short vowels are lengthened ("Johnsen vowel") and the diphthongs, pure long vowels do not partake in qualitative alternations, but we have also seen why only [e:] and marginally [ɑ:] can do so.[74] Below, we reproduce some data exemplifying the immunity of pure long vowels to element spreading (C-V interaction).

[74]Recall that [e:] decomposes into [ia] in the C´-C context (but not word-finally!), while [ɑ:] is fronted to [a:] in C´-(C). Note that in both cases we are dealing with the influence of the preceding palatalised onset.

(75)

C´-C´	[k´u:n´]	*ciúin*	"calm"
	[k´i:l´]	*cíl*	"raddle"
	[f´o:l´]	*feoil*	"meat"
	[g´e:l´]	*géil*	"surrender"
	[χ´a:n´]	*Sheáin*	"name/gs."
C-C	[du:n]	*dún*	"close"
	[ki:səχ]	*cuíosach*	"fair"
	[ko:tə]	*cóta*	"coat"
	[ge:l]	*Gael*	"Irishman"
	[bɑ:s]	*bás*	"death"

First of all, notice that [i:] in [ki:səχ] and [u:] in [k´u:n´] are found in the contexts from which short [i] and [u] are banned (*CiC, *C´uC´). Additionally, while short [e] is impossible between two velarised consonants, its long counterpart is found in this context although it is slightly retracted (Ó Cuív (1975:16)). Likewise, the short [a] or [ɑ] were not found between two palatalised onsets (hence [f´ar / f´ir´] *fear / fir* "man/gs."), while the long [a:] is possible in this context.[75]

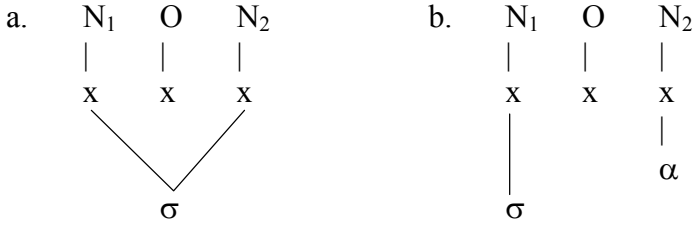
Given our assumption that Irish pure long vowels have the structure of a sequence of nuclei rather than a branching nucleus we must account for these distributional differences between short and long vowels. This, in effect, means that we have to consider possible reasons for the lack of interaction of pure long vowels with element spreading. Recall the discussion of the *Minimality Condition* (Charette (1989)) in 3.1.2 where we considered the possibility that this condition might be effective in Irish.

The main idea was that the structure of a branching nucleus should protect the melodic material lodged in such a domain from external influence. Since the main thrust of that proposal refers to the constituent structure (syllabic hierarchy) rather than to the substantive aspect of the phonological representation (melody) it carries the prediction that

[75]Nonetheless, it must be acknowledged that a sequence (C´a:C´) in which the second consonant is not palatalised due to a morpho-phonological process (i.e. case marking) as in e.g. [ʃa:n / ʃa:n´] *Seán / Seáin* "name/gs." is rare.

both pure long vowels and diphthongs should behave in the same fashion with respect to e.g. harmony processes. This is not the case in Munster Irish, as long vowels behave differently from diphthongs and it seems that the decomposition of [e:] points to the reason for this. Let us look again at the structure we want to propose for long vowels ((76)a) and diphthongs ((76)b).

(76)

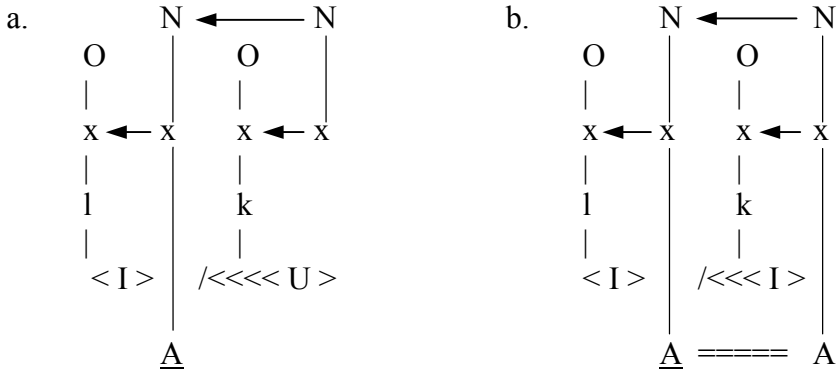


The decomposition of Munster [e:] to [ia] indicates that it is the melodic (substantive) aspect that is crucial and not the formal (structural) one, or at least, that both aspects are equally relevant in the distribution and derivation of that object. This assertion finds support in the facts concerning the immunity or "opaqueness" to palatalisation or velarisation of certain short nuclei which we view as A-headed, where, clearly, the immunity is due to the status of the melodic element lodged in the nucleus.[76] Thus one way of accounting for the immunity of long vowels would be to refer to the "integrity" that a structure like ((76)a) exhibits. This integrity, as opposed to diphthongs, may be derived from the fact that the same melodic material is associated to both nuclei, and it is only when a vowel decomposes (e.g. [e:] to [ia]) that the nuclei become susceptible to phonological processes. Another possible explanation is connected with the notion of headedness which, in fact, follows directly from the structure in ((76)a). Let us elaborate on these two possible factors.

The proposal that doubly linked melodic material exhibits stronger potential in terms of immunity to phonological processes finds support in Irish not only when long vowels are involved. Recall the phenomenon of A-support in the alternation [l´ak / l´ek´ə] *leac / leice* "stone/gs." in which the element 'A' is not suppressed in the genitive case as in e.g. [f´ar / f´ir´] *fear / fir* "man/gs.". This we ascribe to the fact that 'A' in the first nucleus in [l´ek´ə] is supported from the following nucleus containing an identical element.

[76]See also the behaviour of Irish [r], which will be treated as A-headed, with respect to palatalisation (chapter 4.).

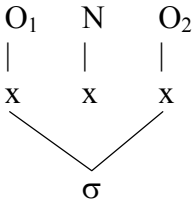
(77)



Note that this support phenomenon may be now understood as double linking of the element 'A', i.e. this element is licensed in two nuclei under government, hence, it is not liable to suppression any more. This interpretation, in fact, points to the similarity between the [l´ak / l´ek´ə] alternation and the composition / decomposition effects in which Munster [e:] is involved e.g. [gr´iən / gr´e:n´ə] *grian / gréine* "sun/gs." and [m´iar / m´e:r´ə] *méar / méire* "finger/gs.", to which we have referred in this chapter.

A similar phenomenon of element support is to be found in the consonantal system of Irish which we will discuss at length in the following chapter. Suffice it to say now that such effects will not be surprising at all given the fact that structurally, our long vowels are identical to consonant geminates proposed for some languages (see e.g. Kaye (1990:322), Bloch-Rozmej (1994)) which we illustrate below.

(78)



In our analysis, the Munster sonorant geminates (3.2) are viewed as a rhymal complement (coda)-onset relation rather than an interonset one. However, interonset relations appear to exist in Munster and involve homorganic consonantal sequences which contain a mute nucleus as in ((78)) above (see Cyran (1996a) and chapter 4).

As far as the headedness is concerned as the possible factor contributing to the immunity of pure long vowels, its main advantage is that it correlates the immunity of certain short vowels with that of long ones. Recall that in the immunity short "opaque" vowels to element spreading is attributed to their headed nature. However, the headedness of pure long

vowel follows directly from the fact that the melody is linked to two positions (Cobb (1993)). Thus the answer to the question of immunity may in fact involve a combination of the two factors, i.e. melody licensing in two positions and headedness. These appear to be related issues.

Note that we may now understand the reason for the susceptibility of diphthongs to element spreading in the following way: since the elements in diphthongs are not licensed in two positions their interaction with palatalisation and velarisation should be determined only by the lexical status of the melodic material lodged under the two separate nuclei. What we mean by status is simply whether the element is headed or not.

The headedness possibilities of short nuclei, in turn, are made precise by our analysis of the short vowel system. Namely, lexically only 'A' may be headed, which includes (A), (I.A) and (U.A) while the headedness of 'I' and to some extent 'U' is derived (2.4). In this light, the strict dependence of the first element of the diphthongs [iə] and [uə] on the quality of the preceding onset and the effects of glide formation within the diphthongs [ai] and [au] are no longer surprising, as they mirror the facts found in the short vowel alternations.

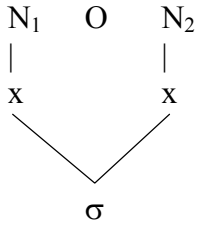
Thus, in fact, the immunity of pure long vowels can be accounted for by referring to the substantive aspect of their phonological representation, i.e. headedness which is lexically restricted to certain elements in the case of short vowels, while all long ones are headed due to the double linking. In this interpretation the only contribution of the structural (formal) aspect of representation is that two positions are involved regardless of whether they are separated by an empty onset (e.g. [i:] in [si:m´] *suím* "I sit") or a filled one (e.g. [k´] in [l´ek´ə] *leice* "stone/gs." ((77)b) above).[77]

Nonetheless, we also have to deal with a situation in Irish where even certain diphthongs show an "integrity" which is normally attributed to pure long vowels (e.g. [awiʃ] vs. [auʃ] *amhais* "servant/gs."). Following Ritter (1994) we may propose that such objects, may be accounted for by employing the structure of a nuclear sequence separated by a positionless onset. This proposal constitutes an alternative interpretation of immune pure long vowels ((79)a) and accounts for the immunity of certain diphthongs ((79)b), though it shifts the brunt of explanatory power to the structural aspect of representation.

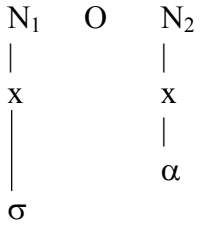
[77]Recall that our analysis of the decomposition of [e:] to [ia] also refers to the substantive aspect of that vowel, namely, to the restrictions concerning the combinability of 'I' and 'A'.

(79)

a.



b.



The structure ((79)b) allows us to view the inalterability of [au] in the following ways. One interpretation might be that the element 'U' cannot be pushed out of its nucleus because it has nowhere to go. The other possible explanation of the inalterable structure might be that the integrity of the diphthong is stronger when the respective nuclei are not separated by a skeletal point. This assertion might also help us understand the disparate behaviour of "pure" long vowels as opposed to short nuclei and diphthongs.

The structure of two successive nuclei separated by a positionless onset can, in fact, be assumed to be the representation of inalterable long vowels in general (Ritter (1994)). In other words, such vowels behave like branching nuclei which might pose the question as to what constitutes the difference between the structure of inalterable sequences of nuclei (with positionless onset) and a branching nucleus? It seems that phonologically they will behave in a similar fashion, i.e. they will show integrity and immunity to harmony processes, and may exhibit the same characteristics as far as stress placement is concerned, which is the case in Irish. The following section illustrates a possible distinction between the two structures.

3.4.5. **Binarity saved or savaged?**

There is one important prediction following from the presence of the fused structure in a language like Irish which contains branching rhymes as well, namely, we can expect to find surface forms that apparently violate the binarity theorem, i.e. we may find forms with super-heavy rhymes. This seems to be the case in Irish where instances of super-heavy rhymes do not seem to be conditioned as they are in e.g. English (see Harris (1994a:77)). Consider the data below and the structures in ((81)).[78]

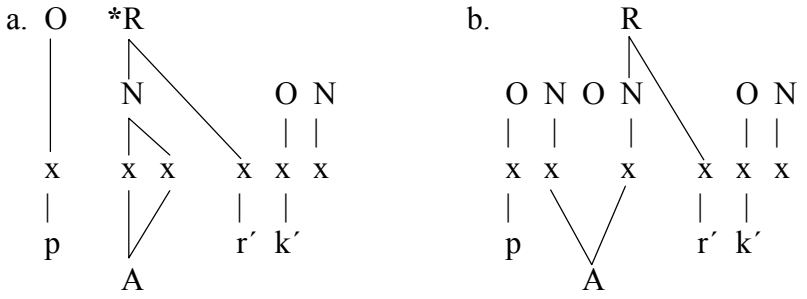
[78]Two forms of the data below alternate with short vowels, i.e. [rauŋg / raŋənə] *rang / ranganna* "class/pl." and [lu:ŋg / liŋ´ə] *long / loinge* "ship/gs.". The existence of these alternations may be put down to the operation of Proper Government whereby the second nucleus of the "long" vowel is properly

(80)

[pɑːr´k´]	*páirc*	"field"
[ɑːrd]	*ard*	"high"
[tɑːr´g´]	*táirg*	"to produce"
[rair´k´]	*radhairc*	"sight-gs."
[rauŋg]	*rang*	"class"
[luːŋg]	*long*	"ship"

Given that e.g. a long [ɑː] is a branching nucleus in Irish, then the only possible structure that can be assigned to the word *páirc* would be that in ((81)a). On the other hand, the assumption that Irish long vowels are sequences of nuclei yields the licit structure ((81)b).[79]

(81)



The structure in ((81)a) is a blatant insult to the binary theorem which says that syllabic constituents can maximally contain two positions. Notice that the constituent rhyme contains a branching nucleus and a "coda". The structure in ((81)b), on the other hand, conforms to the condition on phonological structure which says that syllabic constituents are maximally binary. Thus, if the structure of long vowels in Irish indeed corresponds to a nuclear sequence, which is what we have established, then ((81)b) would be the only possible structure of the alleged super-heavy rhymes in this language (cf. Cyran (1994)).

One should add here, however, that this analysis has some grave consequences for the binary theorem and the apparent solution to its violation in ((81)a) may in fact prove fatal.

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governed by the vowel in the inflectional ending. The simplification of the consonantal cluster eliminates a governing domain and thus makes the possible the application of Proper Government (Gussmann (p.c.)).

[79]Notice that, if this analysis of supper-heavy rhymes could be used as an argument against branching nuclei in Irish, then the forms in (64) show that also [ɑː] must be a sequence of nuclei.

Given that vocalic length can be represented as a NON sequence the theorem is losing its empirical weight since it becomes impossible now to formulate what would constitute evidence to the contrary (Harris (p.c.)).[80]

3.4.6. **Conclusions**

We have seen that the vocalic system of Irish is complex and very interesting from the point of view of phonological representation and principles governing the existing processes as well as the distribution of segments. We have tried to pin down a few principles to capture the most operative alternations by making certain assumptions concerning both the formal and the substantive representations of Irish vowels.

As far as the substantive aspect of the representation of Irish vowels is concerned, we proposed that the lexical representation of Irish short vowels is partly defined by the environment, i.e. the I/U quality of flanking consonants and spreading of 'A'. We concentrated on the interaction between resonance elements in spreading processes as well as on the static distributional patterns and proposed certain restrictions on element combinability in the form of licensing constraints. The main constraint, i.e. *'I' and 'U' do not license operators* accounts for A-suppression when a nucleus is affected by palatalisation (e.g. [sop / sip´] *sop / soip* "wisp/gs." and [f´ar / f´ir´] *fear / fir* "man/gs."), as well as for vowels raising in both palatalised and velarised environments (e.g. [l´et´ir´ / l´it´ir´] *letir* "letter" and [knok / knuk] *cnoc* "hill").

The dependence of short nuclei on the specification of the preceding onset has been formally expressed in the form of the *Sharing Condition* which requires that every O-N licensing relation contains one of the elements I/U. This proposal is supported by such phenomena as palatalisation / velarisation of the definite article (I/U-spreading) and blocking of element spreading by "buffer" elements.

The phenomenon of spreading itself which we view as part of the phonological representation of short vowels, may be redefined to express its static nature by invoking domains of application or identification with the element lodged within a particular domain. As an example of this we may recall the form [k^{w}id´] *cuid* "part" in which the palatalising

[80]For a version of GP which does not employ binary constituents see e.g. Lowenstamm (in press) and

element 'I', lodged in the O_2-N_2 licensing domain,[81] identifies all the positions to the left except O_1 which shares 'U' with the nucleus N_1 thus beginning a domain defined by the quality of that element. In this case the element 'U' constitutes a buffer to further spreading of 'I', or a limit to the domain identified by (licensed by) 'I' depending on whether we want to stress the dynamic or static nature of the phenomenon. An additional factor delimiting domains of I/U spreading (licensing) is headedness of certain short nuclei, the so called "opaque" vowels.

The analysis of long vowels and diphthongs demonstrated that if the findings concerning the substantive aspect of the vocalic system were to be applied to the existing effects of element interaction in diphthongs then a different view on the formal structure of Irish long vowels and diphthongs should be taken. Particularly instructive in pursuing the possibility that Irish long vowels are in fact sequences of two short nuclei rather than branching nuclei is the behaviour of Munster [e:] ((de-)composition) as well as the derivation of [i:] and [u:] as a result of fusion of two successive nuclei when an intervocalic onset is delinked.

The question of immunity of most pure long vowels to element interaction can be dealt with in two ways. Either by referring to the substantive factor, i.e. headedness, which unifies the behaviour of pure long vowels with "opaque" short vowels, or by assuming that structurally pure long vowels and certain diphthongs contain a positionless onset while the basic structure, i.e. a sequence of nuclei is maintained. It seems that to account for the variety in the behaviour of long vowels and especially diphthongs one has to admit that the structural and melodic aspects of the Irish vocalic system are complementary.

In the following chapter, we will investigate the possibility of accounting for certain phenomena concerning the consonantal system in which resonance elements are involved. We begin with an assumption that there should not be too much of a discrepancy between the behaviour of resonance elements as witnessed in the vocalic system and their contribution to the phenomena involving consonants.

Scheer (1994, 1996).

[81]The nucleus N_2 is justified by the general principle of *Coda Licensing* (Kaye (1990)).