University of Massachusetts Occasional Papers in Linguistics

Volume 16 *UMASS Occasional Papers -- Number 14 -- Papers in Phonology*

Article 5

1990

Syllabification, Compensatory Lengthening and Epenthesis in Irish

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0. Introduction

A central issue in recent work on Compensatory Lengthening and Epenthesis (Hayes 1988, Itô 1989) has been the role of a theory of syllabification that is based on quantity or weight distinctions within the syllable. This approach was originally proposed by Hyman (1984) and also by McCarthy and Prince (1986, 1988) who argue for minimal specification underlyingly, encoding the light vs. heavy syllable distinction in terms of distinctive underlying moraic structure: a light syllable is monomoraic [$_{\sigma}$ μ], whereas a heavy syllable is bimoraic [$_{\sigma}$ μ μ]. While the latter is taken as a basic premise in the works mentioned above, the issue of how syllabification takes place in such an approach remains to be explored in greater detail.

In this paper I will outline an approach to syllabification that is compatible with the specific claims made in these works. I partly follow McCarthy and Prince and Hayes' algorithmic approach in their discussion of Moraic Theory but propose a more elaborated version of syllabification within this framework. The approach is essentially templatic but incorporates a certain amount of initial syllable building rules.

In the following outline I propose that syllabification is initiated by a set of intrinsically ordered initial syllable

building rules. The rules apply universally, and essentially yield core (CV) syllables. Following this initial syllable building, all remaining unsyllabified material is syllabified by exhaustive mapping to a language particular prosodic template that is stated in terms of moraic constituency. All language particular well-formedness conditions and constraints on syllabification apply to the mapping process.

Within this approach I will account for a number of vowel length alternations and epenthesis rules in Irish, and the interaction of these alternations and rules with syllabification. In the discussion I will derive representations and discuss particular phonological rules for Irish that motivate this approach to syllabification.

1. Moraic Structure and Syllabification

1.1 Following the works referred to above, and in particular McCarthy & Prince (1988) for lexical representations, I am assuming that contrastive length (quantity) distinctions are lexically specified. This is done by specifying the moraic segments in the underlying representation: short vowels contrast with long vowels at this stage by being nonmoraic whereas long vowels are moraic.

(1)

Representing short vowels as moraic underlyingly is redundant: that they are represented moraically in syllable representations is predictable and can be derived during syllabification. Similarly, length distinctions for consonants (short vs long/geminate) are represented as follows:

(2)

The initial syllable building rules that apply are:

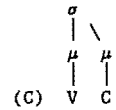
(3) 1. Assign a mora to all vowel segments.
2. Assign syllables.
3. Adjoin a prevocalic consonant to the right.

Double linking of any vowel that is represented underlyingly as moraic is derived by (3)1. Long vowels are therefore represented as bimoraic at this stage, while short vowels are represented as monomoraic. Double linking of long consonants, by contrast, is derived by later association (3)3., whereby an

intervocalic moraic consonant is associated as the onset of the following syllable.[1]

The second rule above which assigns syllables requires elaboration. Syllables universally require one, and only one, nuclear slot (a vowel in most languages). Syllables will therefore be assigned to moras that dominate vowels, unless the inventory of possible nuclei in a particular language includes syllabic consonants, in which case this would have to be prespecified for that language. Furthermore, syllables are subject to a template that states prosodic structure, e.g $\sigma \rightarrow \mu\ (\mu)$. Applying the general principle that all prosodic constituents are maximized, a syllable will, at this stage, incorporate a postvocalic (or post-nucleic) consonant, but only if that consonant is represented moraically, e.g.

(4)



Such incorporation would entail that the language in question has underlying length distinctions in the consonantal system. A long vowel is represented at this stage as bimoraic and will automatically fill the prosodic template. The third rule of syllabification at this level-- (3)3, Adjoin a prevocalic consonant to the right, is the equivalent of the Onset Rule, which requires syllables to have onsets.[2] At this stage of the derivation the only structure that has been built is a CV-syllable (the Core Syllable), unless the syllable has incorporated a moraic consonant or contains a long vowel, in which case the syllable is CVC or CV: respectively.

As syllabification proceeds, building more complex syllables, all language particular constraints and well-formedness conditions on syllable formation apply. At this stage all remaining unsyllabified material is syllabified by mapping onto the syllable template. In the case of a language with a bimoraic template, i.e. $\sigma \rightarrow \mu\ (\mu)$, the mapping process attempts to maximize the prosodic constituency of the syllable. A consonant that does not form the onset of the following syllable and that follows a

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[1] Double linking of consonants therefore arises only in the case of intervocalic long consonants. I will discuss postvocalic, preconsonantal long consonants in a later section.

[2] Hyman (1984) derives the CV-syllable differently but also at this initial stage of the derivation. He does, however, point out a number of problems that arise if the Onset Creation Rule is assumed to precede all other rules, p. 90.

short vowel may receive Weight-by-Position (see Hayes 1988, among others), which means that the consonant in question is assigned a mora by virtue of its position in the syllable. The following is a formulation (mine, not Hayes') of this rule.

(5)

This rule, Weight-by-Position, may be constrained by language particular conditions, as may all syllabification that occurs as a result of mapping to the syllable template.

1.2 In the following sections I discuss data from the dialects of Irish that support this approach to syllabification. In section 2, I illustrate the phonemic contrasts that occur in the northern dialects (2.1) and outline how syllabic representations are derived in these dialects (2.2). I then present similar but contrasting data from the other dialects, the western and southern dialects, and discuss a series of vowel length alternations that occurs in these dialects (2.3). I argue that the underlying representations and the initial syllabification of these forms is the same as for the northern dialects and that the alternations may be accounted for by a rule that applies following syllabification. In 2.5 I motivate the rule of Weight-by-Position for Irish but argue that its application must be constrained. By constraining the application of this rule a unified account may be proposed for the vowel length alternations and for a form of epenthesis that occurs in all dialects. This account involves a rule that delinks moraic consonants, with subsequent reassociation and resyllabification. Other data supports this approach (2.6). This unified approach to the phonological processes discussed raises problems with respect to the application of the rule of Moraic Delinking in the northern dialects, an issue that I address in section 3. In this section I motivate a distinction between derived and nonderived moraic status, a distinction that directly affects the application of the rule of Moraic Delinking in the northern dialects.

2.1 The Northern Dialects

The northern dialects have preserved most of the Old Irish consonantal system which had a full set of length contrasts in the sonorant consonants. The sonorant consonants in this dialect are listed in (6).

(6)[3]

n	n:	n'	n':	
l	l:	l'	l':	
m		m'		
r		r'		
ŋ		ŋ'		

The following examples illustrate the length distinctions:

(7)

a.	móna	[mo:nə]	'turf'(gen)
	modhanna	[mo:nˌə]	'means'
b.	bainis	[ban'is']	'wedding'
	bainne	[ban':i]	'milk'
c.	sin	[s'in]	'that'
	sinn	[s'in':]	'us'
d.	labhair sé	[lawr' s'e]	'he spoke'
	labhair	[l:awr']	'speak'(imper)
e.	geal	[g'al]	'bright'
	geall	[g'al:]	'a bet'
f.	céile	[k'e:l'i]	'spouse'
	céille	[k'e:l':i]	'sense'(gen)
g.	mo leabhar	[mə l'awr]	'my book'
	leabhar	[l':awr]	'a book'
h.	gleannta	[g'l'an:tə]	'valleys
	glanta	[glant]	'cleaned'

The distribution of these sonorant consonants is quite free. The long sonorant consonants may occur in all positions, namely word initially (d. and g.), syllable (and word) finally (c., e. and h.)[4] and ambisyllabically (a., b. and f.). - This distribution raises a number of questions as to what kind of representation we assign the long sonorant consonants; in particular, how do we want to represent syllable initial long consonants? It is not immediately clear how best to represent these instances of long consonants. In order to do so adequately, one would have to discuss the issue of initial consonant mutations, more precisely lenition, and the phonological representation of this process in Irish. However, this would go beyond the scope of the present paper.

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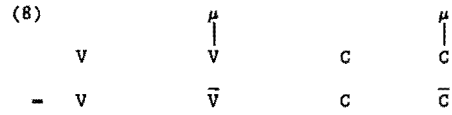
[3] Palatalization, which is distinctive in Irish, is marked by ', i.e. C'. Non-palatalized consonants are referred to as plain.

[4] The forms in h. are morphologically complex. There are no examples that I know of where a long sonorant consonant occurs syllable finally preceding a heterosyllabic but tautomorphemic consonant. As the discussion progresses, it will be seen that an account can be given of the vowel length alternations I am about to discuss that does not depend on any reference to morphological constituency. As regards examples of the kind given in h. but which involve a long sonorant consonant that precedes a nonhomorganic consonant, I will return to this issue in section 2.5.

The long sonorant consonants may also occur following both long vowels and diphthongs, and short vowels (compare a., d. and f. with b., c. and e.),[5]

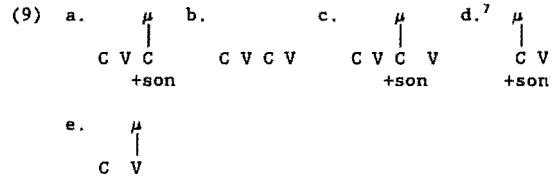
2.2 As a preliminary characterization of the quantity distinctions in (7) let us adopt the moraic representations introduced in (1) and (2), repeated below, to encode the underlying distinctions in this dialect:

(8)



Long vowels and consonants become doubly linked later in the derivation. The following partial representations would be typical underlying forms: possible moraic segments may be characterized as [+son][6]:

(9)



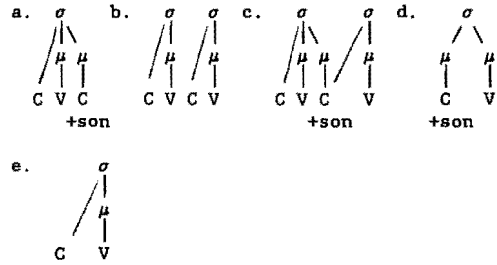
When the syllabification rules in (3) apply, the representations in (9) are syllabified as in (10):

[5] The occurrence of a long vowel (bimoraic) and a long consonant (moraic) tautosyllabically may be a problem for Moraic Theory. Hayes (1988), however, argues that such instances may be expected in languages though they are marked.

[6] I include C and V specifications only to clarify the representations. I am not assuming a CV-skeleton.

[7] This is the case of a word-initial long sonorant consonant.

(10) 1. Assign moras.
2. Assign syllables.
3. Adjoin a prevocalic C to the right[8]

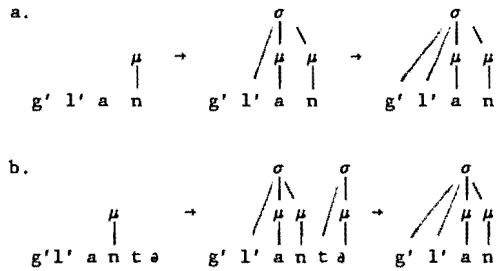


Following this initial syllabification a process of mapping to the syllable template applies to all remaining unsyllabified material, subject to language particular well-formedness conditions that affect syllable composition.

Consider the derivations for the following forms in the northern dialects:

(11) a. gleann [g'l'an:] 'a valley'
b. gleannta [g'l'an:tə] 'valleys'
c. gleanna [g'l'an:ə] 'valley'(gen)
d. glanadh [glanə] 'cleaning'

Lexical representation	Initial syllabification	Exhaustive mapping to template



[8] The representation in (10)a. is not, at this stage, distinct from a similar representation derived by Weight-by-Position. Weight-by-Position will, however, be seen in a later section to be quite restricted in its application.

c.

d.

In the following section I turn to the derivations for the above forms in the other dialects of Irish, and account for surface differences that occur in the prosodic representation.

2.3 Vowel Length Alternations in the Western and Southern Dialects

In the western and southern dialects, a vowel length alternation occurs before sonorant consonants, in particular only before those consonants that correspond to the moraic sonorants in the northern dialects. The length contrast in the sonorant consonants (illustrated in (7) for the northern dialects) has been lost in these dialects, partially in the western dialects and entirely in the southern dialects. In both dialects, however, the quantity distinction has been lost in the plain sonorant consonants. The inventory of plain sonorant consonants in these dialects is:

(12) l n r m ŋ

The vowel alternation may be illustrated as follows for the western dialect:[9]

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[9] It is claimed that in the case of the coronal nasal and lateral sonorants that the distinctions retained in the western dialects are the following:

l' l': n' n':
l n

However the vowel length alternations I am about to discuss are in evidence also for the palatalized consonants:

(i) binn [b'i:n'] 'sweet'
binne [b'in'i] 'sweetest'
(ii) coill [kail'] 'woods'
coille [kil'i] 'woods'(gen)

It is not clear to me at this stage what the distribution of these nasals and laterals is, nor is it clear in the written sources. I discuss the plain consonants in this section simply because this confusion does not arise.

(13)

a.	gleann	[g'l'ɑ:n]	'a valley'
b.	gleannta	[g'l'ɑ:ntə]	'valleys'
c.	gleanna	[g'l'anə]	'valley'(gen)

In the southern dialect the forms are almost the same as those in (13), the only difference being the nature of the vowel alternation: a short vowel alternates with a diphthong.

(14)

a.	gleann	[g'l'awn]
b.	gleanta	[g'l'awntə]
c.	gleanna	[g'l'anə]

This pattern generalizes across the sonorant consonants in both dialects[10], e.g.

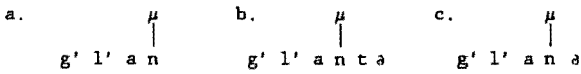
(15)

(i)	geall	[g'ɑ:l]	'a bet'
	geallta	[g'ɑ:ltə]	'promised'
	geallaim	[g'alim']	'I promise'
(ii)	am	[ɑ:m]	'time'
	ama	[amə]	'time'(gen)

It is important to note here that not all sonorant consonants trigger the vowel-length alternations - rather only those sonorant consonants that are represented as moraic in the northern dialects trigger the alternation.

If we pursue a moraic account of the vowel length alternations in (13) and (14), we may posit the underlying representations in (16) and syllabified forms in (17) for these forms. These are identical to the initial representations in the northern dialects, see (11) above.

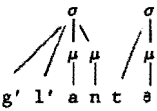
(16) Underlying representations:



[10] r is short in all dialects, including the northern dialects which show vowel length alternations only before this sonorant consonant. For a discussion of these alternations and other alternations involving r, see Ó Siadhail & Wigger (1975).

(17) Syllabified representations:

a. 

b. 

c. 

In order to derive the correct surface representations which contain long vowels in the stressed syllable, we may propose a rule that will delink moraic sonorants in the forms in (17)a. and b. Note that only sonorants are permitted to be moraic in the first place. This rule may be stated as follows:

(18) Moraic Delinking

In a way that is analogous to Itô's interpretation of the Coda Condition (Itô 1986, 1989), this rule will delink singly linked sonorant consonants but will not apply in the case of a doubly linked consonant, assuming the Linking Constraint to hold.

(19) Linking Constraint (Hayes 1986)

> Association lines in structural descriptions are interpreted as exhaustive.

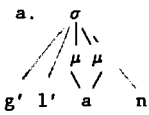
The rule in (18) will correctly apply to the forms in (17)a. and b. above, but not to (17)c. After Moraic Delinking has applied we have the following intermediate representations for (17)a. and b., respectively.

(20) a. 

b. 

Compensatory Lengthening follows delinking, not as a language particular phonological rule but rather from the principles of syllabification. The resulting forms for (20)a. and b. (**gleann** and **gleannta** respectively) are:[11]

[11] The final representations of intervocalic sonorant consonants (which fail to undergo Moraic Delinking) and the preconsonantal sonorant consonants (which are delinked and subsequently resyllabified, but as nonmoraic) in this account are distinct. However the phonetic realization of the intervocalic

(21) a. 

b. 

It is crucial to this account that the rule in (18) not apply to doubly linked consonants, e.g. (17)c. - this was motivated by invoking the Linking Constraint. The abstract nature of the underlying representations is motivated by the restricted distribution of the vowel length alternations which occur only preceding sonorant consonants and in particular only preceding those sonorant consonants that correspond to the moraic consonants in the northern dialects. In order to account for the vowel length alternation in the forms in (20)a. and b. we must permit moraic representations underlyingly that are later delinked by rule.

So far I have motivated (i) underlying representations that represent quantity distinctions in terms of moras and (ii) a dialect particular rule that delinks moraic consonants, thus creating the environment for Compensatory Lengthening.

2.4 Mora Assignment: Weight-by-Position

2.4.1 During the course of syllabification we have another means of assigning moras to [+son] consonants, as pointed out in section 1. Following initial syllabification all segmental material remaining unsyllabified is syllabified, by mapping to a template: $\sigma \rightarrow \mu\ (\mu)$ in the case of all the dialects of Irish. An unsyllabified sonorant consonant that follows a short (monomoraic) vowel is assigned a mora by virtue of its position in the

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sonorant consonants in the western and southern dialects is nongeminate, in contrast with the northern dialects. (They are, however, longer than their preconsonantal counterparts). The distinct prosodic representations requires explanation. One possible approach to this problem may be to adopt a proposal made by Borowsky, Itô & Mester (1984). In this article the authors predict that (true) geminates and ambisyllabic consonants are in complementary distribution, i.e. a language will not have both - the prosodic representation they propose for geminates and ambisyllabic consonants are identical, but the phonetic interpretation differentiates them. Extending this proposal to the Irish dialects we may say that the northern dialects interpret the representations as geminates, whereas the western and southern dialects interpret them as ambisyllabic consonants. There is in fact an intuition of ambisyllabicity among speakers of these dialects. One important difference between the representations in Borowsky, Itô & Mester and those in this paper is the moraic status of the consonants in question. It is not clear how this might affect the proposal being suggested.

syllable. This process, Weight-by-Position was formulated in (5), amended for Irish below. (I discuss the motivation for this initial amendment in the next section).

(22)

The above rule yields intermediate representations like the following:

(23) gorm 'blue' dearg 'red'

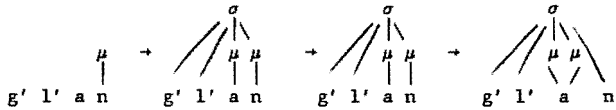
I will return to these forms and present the basic evidence for Weight-by-Position in Irish in section 2.5. Let me first, however, assume such a rule and discuss constraints that must hold of it.

2.4.2 Word final extrasyllabicity

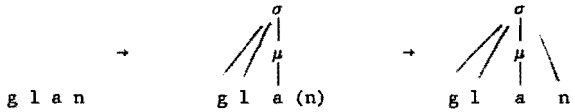
We must stipulate that word final sonorant consonants are extrasyllabic for the purposes of this rule. The data I discuss for the remainder of this section are from the western dialects.[12] That word-final sonorant consonants are extrametrical is motivated by the following data: Compare the forms gleann [g'l' :n] 'a valley' and glan [glan] 'clean' - apart from the difference in palatalization in the initial cluster, the only difference is in the quantity (and the quality) of the vowel. The derivations of these forms are as follows:

[12] The data from the southern dialects differs only in the character of the lengthened vowel which becomes diphthongized. The northern dialects differ in that they do not have vowel lengthening.

(24) (i) gleann [g'l' :n]



(ii) glan [glan]



These forms differ lexically in that the first form has a moraic final consonant while the second form does not. The difference in vowel quantity in these forms could not be accounted for if the (word) final consonant in glan were assigned a mora by Weight-by-Position. If this were the case Moraic Delinking would apply with subsequent Compensatory Lengthening. We need word final extrasyllabicity to avoid this possibility.

2.4.3 Constraining the application of Weight-by-Position

Weight-by-Position as stated in (22), however, must to be constrained in its application. Consider the following forms:

(25)	a. glan	[glan]	'clean'
	b. glanta	[glantə]	'cleaned'
	c. glanaim	[glanim']	'I clean'

The phonetic representations in (25) indicate that no vowel length alternation occurs in these forms. Nor is the syllable final sonorant consonant in (25) a. and b. distinct from the syllable final sonorant consonant in (13) a. and b. (gleann [g'l'ɑ:n] and gleannta [g'l'ɑ:ntə], respectively). We would therefore want the two forms to have similar prosodic representations, differing only in the quantity of the vowel in the stressed syllable. The following surface representations for glanta and gleannta capture both the contrasting vowel length and the nondistinctness of the postvocalic consonant.

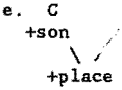
(26) glanta gleannta

If these are the correct surface representations of these forms, it must be the case that the syllable final sonorant consonant in glanta is not assigned a mora by Weight-by-Position. If it were, we would have the following representation after Weight-by-Position had applied.

(27)

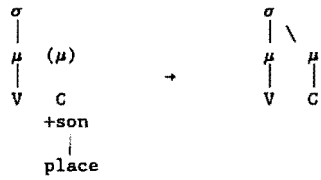
Since this form is identical to the intermediate representation for gleannta (see (16)b.) which subsequently undergoes Moraic Delinking and Compensatory Lengthening, we would have to make some undesirable stipulations to prevent the same derivation here. Instead we can constrain the application of the rule of Weight-by-Position.

In the example in question, glanta, the postvocalic sonorant consonant is homorganic with the following stop, i.e.



If we assume that the shared place node inhibits the application of Weight-by-Position then the n in glanta will not be assigned a mora. We can achieve this by formulating Weight-by-Position in such a way as to require that moraic status be assigned only to singly linked unsyllabified [+son] consonants that follow a short vowel.

(28)



Furthermore, if we assume that the representation of the homorganicity of this cluster in glanta is non-distinct from that of the same cluster in gleannta, then we must conclude, that contrary to Weight-by-Position, the delinking rule does not care about linking to non-prosodic categories, i.e. subsegmental

features. Delinking takes place in spite of the shared place node. This difference is captured in the distinct formulations of both rules. Moraic Delinking as stated in (18), repeated below, does not refer to any subsegmental association lines.

(18) Moraic Delinking

2.5. Further evidence for constraining Weight-by-Position

Introducing a rule of Weight-by-Position and constraining it as suggested in the previous section has desirable results elsewhere in the phonology. Consider the following data:

(29)	gorm	[gorəm]	'blue'
	dearmad	[d'arəməd]	'a mistake'
	dearg	[d'arəg]	'red'
	meirgeach	[m'er'igəx]	'rusty'
	ainm	[an'im']	'a name'
	seanchai	[s'anəxi:]	'a storyteller'
	seilbh	[s'el'iv']	'possession'
(30)	cainteach	[kan't'əx]	'talkative'
	ailse	[al's'i]	'cancer'
	anraith	[anrə]	'soup'
	anlann	[anlən]	'sauce'

The data in (29) above illustrate a process of epenthesis that applies in all dialects.[13, 14] The initial consonant of the underlying medial clusters in (29) and (30) is a sonorant consonant. The underlying clusters in (29) are nonhomorganic while those in (30) are homorganic. Keeping in mind the constraint on Weight-by-Position, whereby Weight-by-Position

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[13] This form of epenthesis occurs also in all Scottish Gaelic dialects. In these, however, the inserted vowel undergoes vowel harmony (see Borgstrom 1940, also Clements 1986), e.g.

(i)	dearg	[d'arak]	'red'
	orm	[r m]	'on me'

[14] This form of epenthesis is distinct from another form of epenthesis that occurs in the southern dialects. The latter epenthesis is the result of a constraint on syllabification in these dialects that rules out complex onsets: *[$_\sigma$ C C ,

e.g.	eagla	/aglə/	[agələ]	'fear'
	cúpla	/ku:plə/	[ku:pələ]	'a couple'
	aifreann	/af'r'ən/	[af'ir'ən]	'Mass'

(see Wagner (1964), Breathnach (1947))

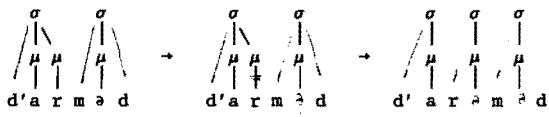
cannot apply to linked structures, the following derivations account for the surface distinction between (29) and (30).

2.5.1 Consider first derivations for the forms that contain a nonhomorganic cluster, i.e. the forms in (31):

(31) a. gorm [gorəm]

Moraic Delinking — Epenthesis & resyllabification

b. dearmad [d'arəməd]



Moraic Delinking — Epenthesis & resyllabification

In the derivations in (31)a. and b. above, the postvocalic sonorant consonant, which is nonhomorganic with the following consonant, in both cases is assigned a mora by Weight-by-Position during syllabification. After syllabification has taken place, the Moraic Delinking rule applies, delinking any mora that dominates a consonant. The number of moras is preserved by the application of epenthesis. This form of epenthesis is not the usual epenthesis-as-insertion but rather is epenthesis as mora-preservation, just as Compensatory Lengthening applies to preserve moraic structure.

By unifying the account of this form of epenthesis and the account of the vowel length alternations in section 2.3, it would appear that we can make the following generalization about mora-preservation (following Moraic Delinking) in Irish:[15]

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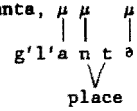
[15] Ó Baoill (1980) also outlines a hypothesis of mora preservation to account for these processes, along with preaspiration, in Scottish Gaelic. The approach taken in that work and that of the present paper are quite different however.

To preserve the number of moras, and thus syllable weight, the default process in Irish is epenthesis. When epenthesis is blocked, e.g. by a linked submatrix, lengthening of the preceding vowel occurs, i.e. Compensatory Lengthening.[16]

Notice that blocking will occur only with underlying moraic consonants. Mora assignment to underlying non-moraic consonants (Weight-by-Position) would be blocked by the same linked structure.

2.5.2 What constitutes a linked submatrix in Irish?

The question of what constitutes a 'linked submatrix' arises here. It seems clear that a shared **place** node constitutes a linked submatrix, hence in a case like **gleannta**,



epenthesis cannot apply following Moraic Delinking, rather the preceding short vowel spreads to associate to the unlinked mora. When the delinked consonant does not share a place node with the following consonant, we expect epenthesis to occur, as in the cases in (29).

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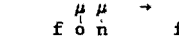
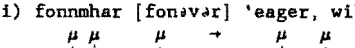
[16] For evidence that morphological complexity is not heeded by the rule of Moraic Delinking, see the data presented in O Baoill (1980:100), (although Ó Baoill uses the data to argue a different point). The relevant data involves the derivational suffix -mhar [-v r] in the southern dialects:

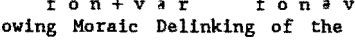
(i) fonn [faun] 'desire'



(ii) fonnmhar [fonəvər] 'eager, willing'



Following Moraic Delinking of the final /n/ of the stem **fonn**, epenthesis applies -- in spite of the morpheme boundary. In (i), on the other hand, the second mora is preserved by Compensatory Lengthening. If level ordering held here, we would have the following derivation for (ii):



Consider the following cases, however: the inflectional suffixes for the impersonal and for the future analytic forms are the following:[17]

(32) Impersonal:	-f(e)ar	[-hər]	(Western dialect)
		[-f'ər]	(Southern dialect)
e.g.	déanfar	[d'iənhər]	(W)
		[d'e:nf'ər]	(S)
Future:	-f(a)idh	[-hə(j)]	(W)
		[-hig']	(S)
e.g.	déanfaidh	[d'iənhə]	(W)
		[d'e:nhig']	(S)

Notice that in both suffixes the initial consonant is voiceless. Furthermore this voiceless consonant devoices the preceding consonant (i.e. the final consonant of the verb stem). For discussion of this phenomenon, see Wagner (1959:16), de Bhalldraithe (1945:102) and Breathnach (1947:138) for the northern, western and southern dialects, respectively.[18] What we have in these forms then, is a voiceless sonorant consonant followed by another voiceless consonant, e.g.

(33) (Western dialects)		
meallfaidh	[m'ɑ:lhə]	'will lure'
teannfaidh	[t'ɑ:nhə]	'will tighten'

In spite of there being no shared node in these forms, Compensatory Lengthening of the preceding vowel occurs, rather than epenthesis. (Compare the forms in (33) with a form in which the moraic consonant is intervocalic, thus doubly linked, preventing Moraic Delinking from applying: meallaim [m'alim']). In the cases in (33) then, it is the shared [-voice] specification (derived by assimilation following morpheme concatenation) that provides the shared submatrix. These cases therefore are not a problem for the account being proposed.[19]

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[17] 'Analytic' is the term traditionally used for the form of the verb that is not inflected for person/number, but instead is followed by an overt subject.

[18] Of these, only Wagner refers specifically to the sonorant consonants; However the devoicing process is generalised to all voiced consonants in all dialects.

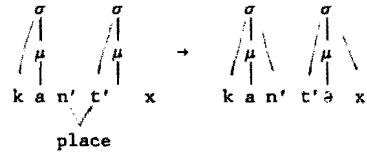
[19] The fact that the suffix in question is an inflectional suffix might at first suggest an account based on level-ordering. Recall that this possibility was rejected in footnote 16 where the example discussed contained a derivational suffix. We could propose level-ordering between the different suffixes -derivational and inflectional- thus allowing an account in which Moraic Delinking and

The foregoing discussion proposes that a shared node other than a shared place node may count as a sufficient block for epenthesis, namely a (derived) shared [voice] specification. Note that, in contrast, a shared specification for palatalization, however this is represented in terms of feature geometry, is not sufficient to block epenthesis. Epenthetic vowel insertion occurs into a palatalized cluster:

(34)	binb	/b'in'b'/	[b'in'i'b']	'venom'
	airgead	/ar'g'ə d/	[ar'ig'ə d]	'money'

2.5.2 Consider next the derivation of a form that contains a homorganic cluster.

(35) cainteach



Initial syllabification — no W-by-P

Such linked structures are never broken up by epenthesis, but neither do they trigger lengthening (Compensatory Lengthening) of a preceding short vowel, as underlying moraic sonorant consonants do. This is further evidence that a sonorant consonant that is the initial consonant of a homorganic cluster is not assigned weight-by-position.[20]

2.5.4 The account of vowel lengthening and epenthesis being proposed in this paper relies on there being two ways a consonant may have moraic status, namely (i)lexical moraic status and (ii) derived moraic status. Moras in the underlying representation represent underlying quantity distinctions. Moras assigned during syllabification also carry weight, but the application of the rule that assigns moraic status in these cases is constrained as suggested in the foregoing discussion, namely, a sonorant consonant that shares a submatrix with a following consonant may not be assigned Weight-By Position. The result of this constraint is that a homorganic cluster may contain a moraic sonorant (hence

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Compensatory Lengthening in (33) occur before the inflectional suffix is attached. This would seem preferable to an account that necessitates reference to linked laryngeal features. However additional data discussed in 2.6.2 support the latter account.

[20] The initial argument was made in 2.4 above for the form glanta [glantə] 'cleaned'.

a long sonorant) only if that mora was present underlyingly. Similarly, a moraic sonorant consonant may appear word finally only if it was present underlyingly. In effect this account requires that long consonants be represented moraically in lexical representations. It would not be possible to account for the series of vowel alternations in 2.3 if this distinction were not made. In a number of cases discussed the moraic sonorant was homorganic with the following obstruent and would not receive a mora if Weight-by-Position were the only way of assigning weight.

2.6. Apparent Exceptions to Epenthesis

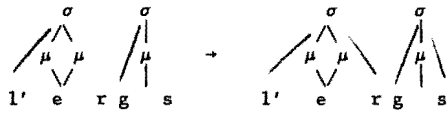
Apart from homorganic clusters there are two other classes of apparent exceptions to this form of epenthesis. These exceptions provide important evidence supporting a moraic treatment of the processes discussed.

2.6.1 The first class of exceptions involves forms that contain an underlying long vowel preceding the cluster, as in the following examples:

(36)	léargas	[l'e:rgəs]	'insight'
	téarma	[t'e:rmə]	'a term'
	Port Láirge	[pɔrt lɑ:r'g'i]	(a town)

It is precisely because of the long vowel that epenthesis is blocked in the above examples: the syllable template is filled by the two moras of the (long) vowel and Weight-by-Position cannot (need not) apply.

(37) léargas



Initial syll.n

The postvocalic sonorant consonant therefore is not assigned a mora from which it would later be delinked. These examples strongly support the analysis proposed in the preceding sections.

2.6.2 The second class of exceptions may be illustrated by the following examples:

(38)	coirpeach	[kor'p'əx]	'a criminal'
	cailc	[kal'k']	'chalk'
	coirce	[kor'k'i]	'corn'
	seilp	[sel'p']	'a shelf'

In these examples a sonorant consonant is followed by a nonhomorganic voiceless stop.[21] If we are to maintain the account proposed so far, we would clearly have to prevent Weight-by-Position from applying to these forms. Assuming the account proposed so far, in principle there should be no reason why Weight-by-Position could not apply: the clusters are not homorganic, nor is the syllable template filled. But recall the discussion of a linked submatrix in section 2.5. In that section I argued that the shared [-voice] specification of the sonorant consonant and the following voiceless consonant be considered an instance of a linked submatrix. In those particular cases [-voice] was derived by assimilation. Assuming this proposal, we can account for the failure of Weight-by-Position in this case by exploiting the inability of this rule to apply to a sonorant consonant that shares some feature matrix with the following consonant. In 2.5 the relevant features were argued to be place and voice. A revised, more constrained formulation of Weight-by-Position would refer to both [place] and [voice].

3. Moraic Delinking in the Northern Dialects

The representations proposed and the rules of Weight-by-Position and Moraic Delinking account for the vowel alternations and the epenthesis discussed, in both the western and southern dialects. If this account is correct, and it does provide a unified account of these processes in these dialects, then the northern dialects, which have this form of epenthesis, must also have the rule of Moraic Delinking. However, these dialects do not have the set of vowel alternations I discussed for the western and southern dialects. Since these alternations arise as a result of Moraic Delinking in the latter dialects, we must account for why Moraic Delinking fails to apply in the northern dialects in these cases.

If we introduce a distinction between derived and nonderived moraic consonants, we can account for the differences between the dialects. A derived moraic consonant receives moraic status during syllabification, i.e by Weight-by-Position. A nonderived moraic consonant on the other hand, is represented underlyingly as a moraic segment. This distinction enables us to propose an account of the differences between the dialects.

In the western and southern dialects the rule of Moraic Delinking applies to all moraic consonants, regardless of their derivational status. In these dialects then, the rule applies

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[21] The clusters in question are of course the most highly favoured heterosyllabic clusters in terms of sonority values, see for example Murray & Vennemann (1983), Clements (1987). However, looking at this issue in terms of sonority does not yield an immediately evident account of this class of exceptions.

postlexically. In the northern dialects, the rule applies only to derived moraic consonants, i.e. in derived environments. The rule in these dialects then, is a lexical one.

One thing that needs to be pointed out at this stage is that the notion 'derived environment' makes no reference to the morphological constituency of the form in question, as is generally the case when this notion is used in Lexical Phonology.[22] Rather 'derived' is being used here to refer only to the moraic status of the sonorant consonants which are the target of the rule. This proposal may be summarized as follows: The underlying contrasts and initial syllabification are identical in all dialects of Irish. Furthermore, all dialects have a rule of Weight-by-Position which is constrained in such a way as to be blocked whenever the target consonant shares either a [place] or a [voice] specification with the following consonant. The dialects differ, however, with respect to the status of a rule that delinks moraic consonants. This rule may be a lexical rule applying only to derived moraic consonants (as in the northern dialects) or postlexical rule applying to all moraic consonants (as in the western and southern dialects). The number of moras in a prosodic representation is preserved following Moraic Delinking by Epenthesis or by Compensatory Lengthening.

4. Conclusion

In this paper I argue for an approach to syllabification in Irish within Moraic Theory. This approach allows us to give a uniform account of a series of vowel length alternations and epenthetic vowel insertion both of which arise as the result of a rule that delinks moraic consonants (Moraic Delinking). Underlying quantity contrasts are expressed in terms of moraic status. Underlying moraic segments are nonderived, in contrast with those segments that are assigned moraic status during the course of syllabification (by a rule of Weight-by-Position). The moraic status of the latter segments is derived. This distinction is central to the unified account of the vowel length alternations and epenthesis, enabling us to differentiate one particular group of dialects where the rule of Moraic Delinking applies only to derived moraic consonants, from the other dialects where the rule applies to all moraic consonants regardless of their derivational status. In the latter case the analysis is quite abstract in that the moraic/nonmoraic distinction is absolutely neutralized on the surface.

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[22] For evidence that morphological constituency is not relevant, see footnote 16.

Acknowledgements

I would like to thank John McCarthy, Lisa Selkirk, Roger Higgins and Scott Myers for comments and encouragement.

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