

## Vowel Quantity and Syllable Structure in Welsh

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### INTRODUCTION

This article reports a brief examination of the relationship between vowel quantity and syllable structure in Welsh. Vowel length is usually transcribed with a length diacritic in the literature on Welsh phonology and it is not treated as predictable. Textbooks of Welsh do give rules for vowel quantity but they are complicated and amount to lists of environments. Yet the more one looks at the data the more one senses that there is a straightforward relationship between vowel quantity and syllable structure in Welsh.

The rules for vowel quantity usually given in textbooks of Welsh are complicated and do not always distinguish between orthography and phonology. This complexity and the occasional indication of long vowels in the orthography suggest that vowel quantity may not be predictable in Welsh. For example, Matthews 1951, transcribing a sample of South Welsh, uses the length diacritic [ː] for every long vowel but he does not transcribe consonant length after short stressed vowels in word final syllables since these consonants are always long by compensation; in other positions he represents long consonants by gemination. On the other hand, the dearth of minimal pairs to confirm phonemic quantity and the apparent complementary distribution of long and short vowels suggest that vowel quantity is predictable, even if only by listing the respective situations where long and short vowels occur. However, a simple listing is not very satisfying and explains little. The very fact that it is at all possible to formulate rules for vowel quantity, albeit complex, indicates that there may be some more systematic relation between long and short vowels in Welsh that is worth exploring.

The factors that are most relevant to the issue of vowel quantity involve certain phonetic events that were introduced prior to Old Welsh during the first millennium AD, namely various mutation, assimilation and simplification processes. This diachronic perspective poses the problem of deciding which of these processes are now concluded, with their phonetic products written into the lexicon, and which processes are still active in the form of productive rules in contemporary speech. The most striking process that is still productive in

modern Welsh is initial mutation (Awbery 1975, Willis 1986), such that, for example, 'dog' is *ci*, *gi*, *nghi* or *chi* ([ki: gi: ŋi: xi:]) depending on the preceding morpheme. Initial mutation is not itself relevant to the issue of vowel quantity, but the possibility of internal mutation has an immediate bearing on the listed lengthening environments. To what extent is there synchronic evidence of productive or fossilized internal processes? Fowkes 1953 points especially to what happens at morpheme boundaries in compounds and finds evidence from internal sandhi that, for example, postvocalic [p t k] result from simplification of consonant groups and that [ð θ x] are mutation products wherever they occur.

Fowkes 1949 also gives examples of how loanwords are adapted into the mutation system, demonstrating a process "that has evidently been going on since primitive Celtic times".

Another relevant factor for syllable structure is the status of the unvoiced nasals and liquids. A strict taxonomic analysis of surface phonemes gives phonemic status to voiceless aspirated fricative /m̥ n̥ ŋ̥ l̥ r̥/ alongside the respective voiced sonorants (e.g. Matthews 1951 and the transcribed sample in IPA 1966:24). Generative solutions usually derive the unvoiced nasals but still recognise /l̥ r̥/ as systematic phonemes. Yet there is striking evidence that the unvoiced liquids are in complementary distribution with their respective voiced counterparts. Some examples for the laterals follow:

/#IV/: [ɨ]	llong	['lɔŋ]	'ship'	(1)
	llech	['lɛx]	'slate'	

(alternating with [l] in initial mutation)

/II/: [i:]	gallaf	['ga:lav]	'I can'	(2)
	pellenn	['pɛ:lɛn]	'ball'	
	coll	['kɔ:l]	'loss'	
	dull	['dil:]	'form'	

contrasting with

/I/: [ɪ]	halen	['ha:lɛn]	'salt'	(3)
	cwl	['ku:l]	'offence'	

/#CIV/: [ɪ]	blith	['bli:θ]	'milk'	(4)
	glo	['glo:]	'coal'	

/VCIV/: [ɪ]	cyflawn	['kɛvlawɪn]	'full'
	murlen	['mirɛn]	'placard'

but /Vn(+)/IV/: [ɨ]	gwinllan	['gwinɫan]	'vineyard'	(5)
	tanllyd	['tanɫid]	'fiery'	

/VIC/: [ɪ]	golch	['gɔlx]	'lye'	(6)
	telm	['telm]	'snare'	
	milfed	['milved]	'thousandth'	

but /VI(+)/t/: [ɨ]	gwallt	['gwaɫt]	'hair'	(7)
	milltir	['miɫtir]	'mile'	

and /VII+CV/: [ɨ]	sillgoll	['siɫ:gɔɫ]	'apostrophe'	(8)
	kollnod	['kɔɫ:nɔd]	'apostrophe'	

(literally 'syllable'+ 'loss' and 'loss'+ 'mark')

Finally, compare such alternations as:

gwaglaw	['gwag+law]	'empty handed'	(9)
llawwag	['ɫaw+wag]	'empty handed'	

These examples strongly indicate that [ɪ] and [ɨ] are in complementary distribution with respect to syllable structure, with a voiced allophone in (3,4,6) and a voiceless allophone in (1,2,5,7,8), while (1) alternates with the voiced allophone when it undergoes the soft initial mutation and (9) illustrates similar alternations across an internal morpheme boundary. However, there is a very small number of loanwords with initial voiced [ɪ] that contradict the first examples at (1) above where /#IV/ > [ɨ]. These exceptions retain the original initial instead of being adapted to the mutation system by being given an unmutated radical, which is the usual way of accommodating loanwords into Welsh. Some examples are *lamp*, *larum* ('alarm'), *letys* ('lettuce'), *lwans* ['lu:ans] ('allowance'). These contradictions do not obscure the larger generalization, in view of the larger number of loanwords that are fully adapted to the mutation system.

#### VOWEL QUANTITY IN WELSH

Welsh vowels are long in stressed and open word final syllables, which in practice means monosyllabics and a few polysyllabics (a Welsh word is normally stressed on the penult of a polysyllabic):

lle	[ˈl̪e:]	'place'	
cân	[ˈkɑn]	'song'	
canaf	[ˈkɑnav]	'I sing'	(10)
caniadau	[kɑnˈjɑdai]	'songs'	
pont	[ˈpɔnt]	'bridge'	

Consonant length (or gemination) is only sometimes apparent from the orthography. Compare:

pen	[ˈpɛn:]	'head'	
pennau	[ˈpɛn:ai]	'heads'	(11)

Short (or non-geminated) consonants can be deduced from the orthography if the vowel happens to be circumflexed, as in *cân* in (1) above.

The vowel lengthening environment is further defined in terms of consonant classes, such that vowels are long in monosyllabic words before:

$$[l n r b d g v \delta f \theta s x] \quad (12)$$

At first sight this seems to be a motley mix of consonants. But if [m̥ n̥ ŋ r̥ ʃ] are taken to be voiceless sonorants rather than obstruents, the lengthening environments can be arranged as follows with each class being successively more constrained as to manner or place:

$$\begin{aligned} &\text{any continuous obstruent,} \\ &\text{or, if discontinuous,} \\ &\text{then voiced and if sonorant then apical} \end{aligned} \quad (13)$$

Jones 1913 also reports half-long vowels in the stressed penults of polysyllabics with the same environments as (12,13) excepting [v δ s], illustrated by the contrasting example *canu* and *cannu*, [ˈkɑni], [ˈkɑni:] ('to sing', 'to whiten'). This is not reported by Matthews 1951 or by the transcriber of the North Welsh sample in IPA 1966:24. My interpretation of Jones's account is that phonologically there are long and short vowels in both final and penultimate stressed syllables, but that the phonetic contrast is more evident in final syllables. This might simply be the consequence of the well known phenomenon of final lengthening, by which the short vowels should also be longer in the final syllables than in the penults. There is also a possible universal phonetic explanation for the lengthening environments (12,13): vowels tend to be longer before fricative

segments and before voiced segments. But these explanations clearly do not cover all instances of long and short vowels, see for example (10,11) above.

Matthews 1951, Jones 1913 and IPA 1966:24 all report that /e o/ tend to be nearer to [e o] in long vowels and nearer to [ɛ ɔ] in short vowels, i.e. there is an allophonic tense vs lax contrast for /e,o/ in the sense defined by Wood 1975. Jones states that this also applies to the half-long vowels in stressed penults. The various authors are less explicit about whether there is similar tense-lax alternation for /i,u/ ([i,u] vs. [ɪ,ʊ]). Matthews and the IPA transcriber note that /a/ is approximately cardinal [a], both long and short, i.e. the timbre is not particularly grave in either case. But the English keywords given in textbooks to exemplify the Welsh vowels give the English-speaking reader the impression that there are tense vs lax allophones [i,ɪ] and [u,ʊ] for /i,u/ and bright vs grave allophones [a,ɑ] for /a/.

The basic lengthening rule, that stressed vowels are long before at most one consonant, is expressed by the following:

$$[+SYL] \rightarrow [+LNG] / \text{--- } C^1 \quad (14)$$

[+STR]

This rule expects all geminates to be set out in the underlying representation:

$$\text{pen} \quad /penn/ \quad [ˈpɛn:] \quad \text{'head'} \quad (15)$$

Note also for the time being that  $C^1$  must be taken from the set of consonants in (12,13). As it stands, rule (14) is general, and is not limited to word final syllables only.

### PHONOLOGICAL PROCESSES

A full specification of the feature complexes involved in (12,13) will not only be very clumsy but will also completely obscure any possible simple validity of (14). Does the feature structure of the vowel lengthening environments really need to be listed in this way, or is there some other regularity that makes such a summary unnecessary?

Any description of Welsh must take into account the various processes of lenition, spirantization, nasal alternation and simplification involved in the mutations. While the initial mutations are not relevant to the present issue, the relics of internal mutations are, since it turns out that they determine the syllabic structure of the lengthening environments.

## 1. Lenition of intervocalic voiceless stops, whereby

-p-	-t-	-k-	(16)
↓	↓	↓	
-b-	-d-	-g-	

Modern Welsh post-tonic *b d g* coming from this source are not geminated and (14) will consequently lengthen the preceding stressed vowel.

2. The spirantization of intervocalic voiced stops and *m*, whereby

-m-	-b-	-d-	-g-	(17)
↘	↙	↓	↓	
-v-	-ð-	-y-	-y-	
		↙	↘	
		-Ø-	-j-	

Modern Welsh post-tonic *v ð* are not geminate.

## 3. The nasalization of voiced stops, whereby

-mb-	-nd-	-ng-	(18)
↓	↓	↓	
-mm-	-nn-	-ŋŋ-	

Many modern Welsh final nasals are geminates and (14) will in such cases not lengthen a preceding stressed vowel. Final *m* is always geminate, and former intervocalic nongeminate *m* was spirantized to *v* by (17), which explains why there is no *m* in (12).

4. The spirantization and aspiration (devoicing) of liquids from underlying clusters under various conditions means that surface *r l* following stressed vowels in Modern Welsh are long consonants derived from underlying geminates as outlined in the introduction. Consequently, they do not form part of the lengthening environment in (12,14).

## 5. The spirantization and simplification of intervocalic geminated voiceless stops, whereby:

-pp-	-tt-	-kk-	(19)
↓	↓	↓	
-f-	-θ-	-x-	

The geminate *-ss-* was also simplified to *-s-*. Following simplification, modern Welsh final *f θ s x* are not geminated, they have their place in (12) and (14) will lengthen a preceding stressed vowel.

Intervocalic *p t k* disappeared through lenition (*p > b* etc. by 16) or spirantization (*pp > f* etc. by 19). Modern Welsh does not therefore have etymological word final *p t k*. Where these occur today, they are in modern loans:

map	['map:]	'map'	(20)
siop	['ʃɔp:]	'shop'	
mat	['mat:]	'mat'	
cloc	['klok:]	'clock'	

For loanwords where an original long vowel has been retained, the final consonant is usually lenited and then accords with (12):

clog	['klo:g]	'cloak'	(21)
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The lengthening environments listed in (12) are thus the consequence of diachronic processes that have resulted in precisely the syllabic structure of the lengthening environment of (14), and the productivity of this rule is illustrated by the way in which this environment is preserved when the syllable structure of loanwords is adapted to it.

## CONCLUSION

The lengthening environments (12) result from diachronic processes of mutation, lenition, spirantization and simplification. Where these are still productive, they will be represented by phonological rules that yield the respective environments of (12). Alternatively, where these processes have ceased to be active, their relics are written directly into the underlying lexical forms as tokens of completed sound changes. In either case, the non-lengthening environments will appear as consonant geminates or clusters that are input to a simple rule

similar to (14), and the tiresome cataloguing of phonetic environments as in (12) will be unnecessary.

The question of quantity and tense-lax differences in stressed penults warrants further attention.

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