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The vowel that cannot be long: the story of the Welsh central vowel [ə]*

Anita Buczek

The aim of this paper is to discuss the role and nature of the central vowel [ə] in the Welsh language. This vowel can be shown to be sometimes present lexically while in other cases it is the realisation of an underlying unlicensed empty nucleus. The distribution of this vocalic segment is somewhat restricted. It can occur both in stressed or unstressed syllables, (provided they are not word-final), and is always short. Schwa is also the outcome of a well attested alternation termed Vowel Mutation, where it can be shown to derive from a number of sources which are of considerable importance for the phonological representation of the schwa vowel in this particular system.

I would like to address two issues concerning the somewhat unexpected and irregular behaviour of this segment, namely why it occurs sometimes in final syllables while generally it is confined to non-final syllables, and why this vowel appears word initially in front of certain heavy consonantal clusters. I employ the principles of Government Phonology as first formulated in, for example, Kaye, Lowenstamm, and Vergnaud (1990), Charette (1991) and Harris (1994). In this model vowels are represented by elements (A), (U), (I) and (_). Although the function of the headless expression (_) in GP is still a matter for debate, in that it is not assumed by everybody to have the status of an element (see, e.g. Backley and Takahashi, Charette and Göksel, and Cyran and Nilsson, this volume), I will demonstrate that it is actually necessary to treat it as an element if we are to describe the Welsh system properly.

1. The facts

To be able to answer the question why the central vowel is never long in Welsh, it has to be determined what this segment is made up of in terms of phonological elements. To establish this, the facts concerning the vocalic system of Welsh have to be examined.

If we look at the phonetic evidence we see that there are eleven vocalic segments in the southern dialect of Welsh.

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(1) *11 vocalic segments (Jones 1984)*

	tense	*open*
high front	[i]	[ɪ]
mid front	[e]	[ɛ]
low front	[ɑ]	[a]
high back	[u]	[ʊ]
mid back	[o]	[ɔ]
central (unpaired)	[ə]	

Certain characteristic distinctions can be observed in relation to these.

(2) a. *Qualitative difference : tense and open series*
b. *Quantitative difference: the tense series is phonetically long*

As for the distribution of the vocalic segments, the close – long series is found only in *stressed* syllables, regardless of the length of the word – monosyllables and polysyllabic forms are grouped together here. All vowels of the open series occur both under stress and in unstressed positions. Since vowel length seems to be contextually conditioned – it is a property of stressed syllables – and thus to a considerable extent predictable, I have proposed elsewhere (Buczek 1996) that underlyingly there are only short vowels, which are lengthened under specific conditions resulting from the combination of two factors: stress and the quality of a given vowel. This means that certain structural requirements have to be met for the phonologically short vowel to become long.

As for the distribution of schwa, it can be observed that the central vowel [ə] may appear only in non-final syllables, both in stressed and unstressed contexts.

(3)

a. *stressed*		b. *unstressed*	
[ˈəskavn]	*ysgavn* 'light'	[kəmˈra:g]	*Cymraeg* 'Welsh'
[ˈkənar]	*cynnar* 'early'	[kəˈmɛrjad]	*cymeriad* 'character'

[ə] is ruled out in word final syllables. Monosyllables and final syllables of longer words are grouped together here: in neither case is the central vowel acceptable. The second restriction is that the schwa vowel may not appear, even in a non-final syllable, immediately adjacent to another vowel. It must always be followed by a consonant or a consonantal cluster.

The restrictions described above hold throughout the vocabulary with the exception of one set of grammatical items.

(4)

[ən]	*yn* 'in'
[ən]	*yn* 'my'
[ən]	*yn* – predicate marker
[də]	*dy* 'your, sg.'
[ər]/[ə]	*yr* / *y* 'the'
[mən]	*myn* 'by' (in oaths)

As we noted above, it is not normal to find the central vowel in monosyllables, furthermore, in two items in (4) it is not followed by a consonant.[1]

There are instances where the central vowel [ə] occurs in words which are monomorphemic. The vowel in such forms observes the same contextual restriction on its occurrence as the vowels in forms consisting of more than one morpheme: it is confined to non-final syllables and followed by a consonant. In the case of the simple forms, [ə] is not involved in any surface alternations, it is simply always there.

(5)

		cf.	
[ˈkə̲bɪð]	*cybydd* 'miser'	[kə̲ˈbəðjon]	*cybyddion* 'misers'
[ˈmə̲nɪð]	*mynydd* 'mountain'	[mə̲ˈnəðoið]	*mynyddoedd* 'mountains'
[ˈkə̲varɪθ]	*cyfarth* 'to bark'	[kə̲ˈvarθjad]	*cyfarthiad* 'barking'

Both in the monomorphemic forms and in their respective complex counterparts, the underlined segment [ə] does not alternate with any vowel. Additionally, there are numerous instances of forms in which the central vowel is the result of phonetic alternations known as Vowel Mutation.

Vowel Mutation affects certain vowels and (surface) diphthongs in the final syllables of polysyllabic words and in (phonologically) stressed monosyllables. When the word is extended through suffixation, which shifts the vowels in question to a new penultimate site, they mutate as follows.

(6) [ɪ] → [ə], [u] → [ə], [ai] → [əi], [ɪu] → [əu]

Thus the mutable sounds are phonetically [ɪ],[u], and [a] and their mutated variant is [ə].

(7)

[brɪn]	*bryn*	[ˈbrənjɛ]	*bryniau* 'hill(s)'
[ku:m]	*cwm*	[ˈkəmoið]	*cymoedd* 'valley(s)'
[hail]	*haul*	[ˈhəilog]	*heulog* 'sun' – 'sunny'

The [ə] in the above forms may be seen as derived from the vowels of the corresponding syllable in the monosyllabic forms. There appears to be a variety of sources for the surface central vowel in Welsh: the [ɪ], [u], and [a] found in the process of Vowel Mutation, the non-alternating [ə] in monomorphemic words, and the "unexpected" [ə] in function words.

2. A solution

2.1. The underlying vowels of Welsh

The first problem concerns the underlying inventory of Welsh vowels. As we have seen in (1) above, there is one member of the class of vocalic segments that seems to be unpaired: the central vowel [ə]. The question that immediately arises

[1] We shall return to these apparent exceptions in the later sections of the paper.

then is whether [ə] is in fact present in the underlying phonological system of Welsh, or is it always the outcome of various processes like Vowel Mutation or the Centralising Rule which specifies the alternation [ɪ, u] > [ə] (Thomas 1984). As evidenced by a number of examples, the schwa vowel alternates with at least three different segments, namely [ɪ], [u], and [a], in non-final syllables. Does that mean that it is always a derived segment? Even in forms like those cited in (3, 4, 5a) above? Thomas (1984) and Williams (1983) argue that this is indeed the case. Thomas (1984) includes both occurrences of schwa[2] in an extension of the vowel mutation rule, which now also covers non-complex words. He claims that a possible source for the non-alternating [ə] is the underlying [ɪ], since in the dialects where the vowel mutation system and the high vowel system have been eroded, the front vowel [ɪ] appears in this place.

However, it seems that the respective analyses of Thomas and Williams, forced upon them by the theoretical framework they apply, are somewhat lacking for they do not say anything about what this segment in fact is. The artificial division into "primary" and "secondary" schwas which they introduce is based on the original source from which the surface output is derived. Neither of them, however, comments on the cases where [ə] results from an underlying [a]. In their analysis it would probably be a "tertiary" schwa. Both discuss in detail the origins and possible present shape of Welsh high vowels in terms of their composition. They do not say anything about the feature specification of the central vowel. In this way, they are forced to conclude that the central vowel is always derived by specific rules. In this paper I would like to claim that [ə] need not be derived from another vowel in every case.

The main difference in the underlying representation of vowels found in traditional phonology and in Government Phonology is that there can be no [ə] underlyingly in the generative framework, but that this is possible within GP. It can be postulated that the surface central vowel is the manifestation of an empty nucleus in Welsh. Its appearance in words having an original, non-alternating [ə] vowel is then the result of interpreting the existing structure. It seems artificial to try to derive it from the vowel [ɪ] by the rules of vowel mutation.

There is a set of data, consisting of words beginning with [ə] followed by a consonantal cluster like [str], [skr], [spr], which provides an additional piece of evidence for treating the schwa vowel as the Welsh cold vowel. A few examples are listed in (8).

(8) [əˈstri:d] *ystryd* 'street'
[əˈskre:χ] *ysgrech* 'scream'
[əˈspri:d] *ysbryd* 'spirit'
[əˈsta:d] *ystad* 'state'

These are all borrowings from English, where the initial clusters [str, skr, st] are allowed. In Welsh, however, these clusters are unacceptable and they needed to

[2] That is, the alternating and non-alternating schwa, like in [ˈkə̲bɪð] – [kə̲ˈbəðjon].

be somehow integrated into the native lexicon by giving them the same shape as such native words as [əsˈtləneð] *ystlynedd* 'name, kindred' or [əsˈkɑ:dan] *ysgadan* 'herring' (cf. Irish *scadán*).

Kaye (1996) postulates an empty nucleus in front of *sC(C)* clusters. This empty nucleus is manifested phonetically due to the failure of *Magic licensing*, which might be viewed as a parameter. For bilingual speakers of Welsh the licensing of the initial empty nucleus in such clusters may be optional since all these words are often heard pronounced without the initial [ə]. When the nucleus is not licensed it receives phonetic interpretation. In the case of Welsh the unlicensed empty nucleus surfaces as schwa.

Additionally, the fact that Welsh [ə] is a phonological empty nucleus neatly explains the appearance of [ə] in the function words listed under (4). The original empty nucleus in these forms fails to be properly governed and hence the structure is realised phonetically. These words never occur by themselves, they constitute one domain with the following noun; in this way the conditions on Welsh [ə] are not violated.

[ə] is in fact an empty headed expression, represented as (_). This amounts to saying that the non-alternating [ə] is empty underlyingly and nothing changes in this context throughout the derivation, with the result that the existing structure is interpreted phonetically within the specific phonological system of Welsh. The alternating [ə] can be said to be empty as well, since whatever the original elemental structure of the underlying segment, after the reduction no elements remain.

2.2. Vowel mutation

Turning our attention now to the cases where the central vowel results from derivation, let us start by looking at the already mentioned vowel mutation. This process is fairly productive in modern Welsh and is typically exemplified by alternations between root forms containing a mutable vowel in the final syllable (or in monosyllables) and inflectional forms, where the addition of suffixes provides the environment for Vowel Mutation.

The mutable segments are [ɪ], [u] and [a]. For the first two the change consists in lowering the segments to [ə]. The other change involves the reduction of [a] to [ə]. Additionally, not every [ɪ] mutates. Morris-Jones (1913:120) claims that only the sound which is written orthographically as *y* mutates, not the variant of [ɪ] written as *u*, something which is true observationally. Traditional phonology tried to explain the difference between the two variants of [ɪ] by suggesting different underlying feature specifications for them. The features they made use of in order to distinguish the two [ɪ]'s seem arbitrary, as if they were introduced only for the sake of the analysis (for example Williams 1983 introduced the feature [+/– length] as opposed to [+/– long]).

On the basis of the facts of vowel mutation and those of other phonological alternations it has to be assumed that there must be two variants of [ɪ]: one

susceptible to the alternation and another which blocks it.[3] Thomas (1984:108) writes as follows:

> *The surface phonetic segment [ɪ] seems to represent two distinct underlying forms; the case for making a distinction between them rests not on their history, nor on the orthographic practice of writing the invariant one as "u" and the alternating one as "y" but on the distinct places which they occupy in the structure of the contemporary language. A significant distinction would surely be lost if we were to confuse those which have a complex phonology with those which do not.*

At the same time, the first variant has to share something with [u] and [a], something which could be regarded as a kind of "common denominator", responsible for the similarity of their behaviour under vowel mutation. I propose that all three segments must be headed expressions, and the point about them is that they do not license any operators – they are simplex phonological expressions.

(9) (I) = [ɪ]
(U) = [u]
(A) = [a]

Vowel Mutation concerns the following vocalic alternations.

(10)

a → ə		i → ə		u → ə	
N	N	N	N	N	N
|	|	|	|	|	|
x	x	x	x	x	x
|	|	|	|	|	|
A	_	I	_	U	_

For Vowel Mutation to take place there must be a full, unlicensed nucleus in the following syllable. What happens, then, is that the elements (I), (U), and (A) delink and the nucleus then surfaces phonetically as [ə]. In GP every element has a phonetic realisation, even an empty-headed expression like (_). Its surface realisation is the central vowel [ə] in Welsh.

Certain forms provide interesting instances of vowel mutation. These are exemplified in (11), where (11a) consists of monomorphemes, and (11b) of related complex forms.

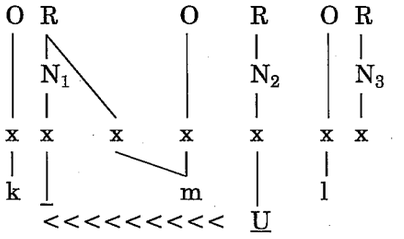
[3] The other variant of [ɪ] is probably a non-headed expression or perhaps it contains the neutral element @ – which is something different from what has traditionally been referred to as the cold vowel. A discussion of this element would go beyond the scope of this paper.

(11)

a.		b.	
[ˈkumʊl]	*cwmwl* 'cloud'	[kəˈmɔlɛ]	*cymylau* 'clouds'
[ˈkumʊd]	*cwmwd* 'commote'	[kəˈmədɛ]	*cymydog* 'neighbour'
[ˈburlʊm]	*bwrlwm* 'gurgling'	[bərˈləmɪ]	*byrlymu* 'bubble over'

In all the examples in (11a) there are sequences of identical vowels [ʊ..... ʊ]. The pre-final [ʊ] of these forms resists lowering. Yet when morphologically complex forms are produced by derivation or inflection, *both* vowels are mutated to yield forms like in (11b). How then can forms like these be interpreted? One possibility is that the position underlined in the above words is not underlyingly filled by the melody of [u] (which is (U)) but rather is simply another case where underlyingly we have the empty nucleus only. A process of vowel copying spreads the (U) element (in this particular case) of the segment in the final syllable leftwards.

(12)



The question arises why the nucleus N_1 is not licensed by Proper Government. Proper Government is blocked in these forms because a governing domain intervenes between the two nuclei. We find interconstituent licensing of the coda–onset type, where the nasals are geminates and [–rl–] is a well formed coda–onset domain.

Some additional evidence can be found in support of the above claim. It can be observed that we do not find [u] in a non-final syllable, unless the word is a borrowing or the following vowel is [u]. Historically speaking, at some stage in the history of Welsh the words in (11) above were pronounced with the [ə] vowel in the penultimate: [ˈkəmul] etc.[4]

When a suffix is added to a word like [ˈkumul] the segment [u] of the final syllable lowers to [ə] when it is no longer in the final syllable, yielding [kəˈməlɛ]. The (U) element is no longer in the structure and cannot spread; consequently, the first nucleus is a melodic copy of the mutated nucleus.
To sum up my view on Vowel Mutation, the segments [ɪ], [u] and [a] lose their head elements, and thus the new structure yields surface [ə] when the segments are followed by a nucleus with a phonetic content within the same governing domain in non-borrowed words.

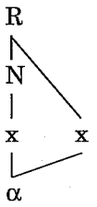
[4] The word was earlier spelled *cymwl*.

What can be found above is a description of the effect of the alternation. As to the cause of it, I can only speculate that it may have originated in the loss of the relation between stress and pitch accent in the language. Originally Welsh had final stress, which combined with a higher pitch (High Tone) on the ultimate syllable. The final syllable of a phonological word is in the best position to support melodic contrast, even in Modern Welsh. After the shift of stress in the Old Welsh period the High Tone remained in its original position. When it is absent reduction may occur as certain combinations seem to necessarily require its presence. We would like to propose that because of inflection / derivation the High Tone is no longer available for the original final syllable, and that this is responsible (in part) for the occurrence of Vowel Mutation. This suggestion, however, needs further research.

3. The vowel that is never long

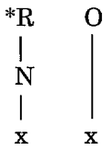
To summarise the claim about vowel length presented in Buczek (1996): I assume that underlyingly we have only short vowels in Welsh. The distribution of short and long vowels depends on three factors: stress, the material that immediately follows the vowel, and the position of the vowel in the word. I argue that an underlyingly short vowel is lengthened if it is in a stressed rhyme with no coda consonant following it. The structure of the lengthened vowel resembles the one known as the "Johnsen vowel", (Kaye 1996) which is illustrated below.

(13)



In a penultimate syllable a sequence of a non branching nucleus followed by an onset should be disallowed. The syllable is stressed, and the rhyme has no post nuclear complement; structurally, then, all conditions for the vowel to be lengthened are met. Hence sequences such as that presented below should not be found.

(14)



Yet in modern Welsh we do in fact find words with the above syllabic structure. They are exemplified in (15) below.

(15) [ˈkəbið] *cybydd* 'miser'
[ˈkəvarθ] *cyfarth* 'to bark'
[ˈkrəvder] *cryfder* 'strength' but [kri:v] *cryf* 'strong'

It appears that [ə] cannot be long in Welsh. This vowel, no matter whether it is stressed or not, whether it is found in a branching or non-branching rhyme, is always short. The question arises what is so unique about this sound that prevents it from being lengthened. If indeed, as I claim in this paper, the schwa vowel is the manifestation of an empty nucleus in Welsh, its structure should block metrical lengthening. Lowenstamm (1986) formulated the following principle which explains why the cold vowel cannot be long.

(16) Cold Headedness Constraint

A segment which has the cold element as its head cannot occupy two contiguous positions.

Welsh schwa has no head at all, it is phonologically an empty expression, and as such it appears to obey the above constraint. I proposed in Buczek (1996) the following conditions concerning vowel length in Welsh.

(17) Vowel Length Conditions for Welsh

a. *A stressed rhyme must branch*
b. *A vowel is lengthened in a stressed rhyme with no post nuclear consonant*
c. *Only a headed expression may be (metrically) lengthened.*

When we look again at the internal structure of the central vowel, we see that it cannot be long because that would violate the above principles. In the light of the above conditions any combination of [ə] → *[ə] [ə] is a contradictory structure which simply does not and cannot exist.

The Cold Headedness Constraint, together with the conditions in (17), account for the fact that the underlying central vowel [ə] cannot be long – it is an empty headed expression. The structure of this particular segment and the structure I suggest for the phonetically long vowels in this language do not permit lengthening.

4. Conclusion

The schwa vowel cannot be long, (or, to be more precise, lengthened) in Welsh because it is a headless expression. A segment which has no element as its head cannot occupy more than one skeletal position. The concept of [ə] as the Welsh realisation of an unlicensed empty nucleus allows us to account neatly for its

somewhat "illegal" occurrence in some function words and words starting with [ə] followed by a heavy consonantal cluster. In the former case the original empty nucleus fails to be properly governed and hence the structure is realised phonetically. In the latter case the empty nucleus preceding the clusters is manifested phonetically due to the failure of *Magic licensing*, which might be viewed as a parameter.

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Licensing constraints and vowel harmony in Turkic languages*

Monik Charette and Asli Göksel

1. Introduction

The role of licensing constraints is a relatively new area of study in phonology. Licensing constraints were first introduced to take over the function performed by charm in the theory of Charm and Government (Kaye, Lowenstamm and Vergnaud 1985). The purpose of this paper is twofold: to enable us to understand the explanatory power of licensing constraints in general, and to derive vowel harmony processes in certain Turkic languages from a set of licensing constraints which also underlie the vocalic inventory of these languages.

Harmony, we claim, is an instantiation of an element licensing itself in a position it governs. The Turkic languages we discuss in this paper, Turkish, Yakut, Kazak, Kirghiz and Old Anatolian Turkish, all have unrestricted I-harmony but differ with respect to U-harmony. This is a joint effect of the absence of a licensing constraint on the element (I), a restraint requiring the element (U) to be head of a phonological expression, and the availability of role-switching in the language. A licensing constraint preventing the element (A) from licensing an operator within a phonological expression also explains the absence of A-harmony in Turkic languages.

The paper is organised as follows: section 2 is a presentation of certain aspects of the Revised Theory of Elements which are relevant to the analysis of vowel harmony in Turkic languages. In 3 we provide a summary of the distributional properties of Turkish vowels. This is followed in 4 by an introduction to the licensing constraints we propose for Turkic languages and to the representation of vocalic expressions in Turkish. Section 5 looks at vowel harmony and how the spreading of elements is derived from the licensing constraints. We then focus on U-harmony and discuss the notion of switching which plays a crucial

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