Exceptional stress and reduced vowels in Munster Irish

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ABSTRACT

This paper focuses on reduced vowels in one of the Munster dialects of Modern Irish, Gaeilge Chorca Dhuibhne. In this dialect, lexical stress depends on syllable weight: heavy syllables (i.e. syllables that contain phonologically long vowels) attract stress; if there are none, stress is initial. There exist exceptions, one of them being peninitial stress in words with no heavy syllables and the string /ax/ in the second syllable. Instead of deriving this pattern from the properties of /x/ in combination with /a/ as has been done in much previous work, the paper argues for the presence of a phonologically reduced vowel in the first syllable. The paper argues that such vowels are phonetically and phonologically different from underlying full vowels that underwent a post-lexical process of vowel reduction.

Keywords: Irish, stress, vowel reduction.

1. INTRODUCTION

1.1. Basic pattern of stress assignment

Gaeilge Chorca Dhuibhne (henceforth, GCD) is one of the Southern (Munster) dialects of Modern Irish spoken on the Dingle peninsula in Co. Kerry, Ireland. According to the 2011 census, a total of 9,236 people living on the peninsula speak Irish, of which only 707 use it daily outside the educational system.

Unlike most other dialects of Irish, where initial stress prevails [8], primary lexical stress in Munster Irish is weight-dependent and can occur on any of the first three syllables [20]. Generally, heavy syllables (H) contain a long vowel or a diphthong, and light syllables (L) contain a short vowel. The basic pattern of stress assignment is cited after [21] in (1) and is schematised in (2), where X stands for a syllable of any weight and brackets denote the repetition of a syllable of the indicated type any number of times. Below, I adopt the transcription used in [20]; see [9] for an extensive list of examples and an OT-analysis, which is not the focus of this paper.

(1)   Word stress falls on the second syllable if it is heavy, on the third syllable if it is heavy and the preceding syllables are light, and on the first syllable in all other cases.

(2)   XˈHX(X)   LLˈH(X)   ˈX(L)   ˈHLH(X)

1.2. Exceptions to the basic pattern

There exist, however, numerous exceptions to this rule. Some are caused by the morphological structure of the word. Thus, some verbal inflection morphemes exceptionally attract lexical stress, e.g. *fógróidh (sé)* [foːgəˈroːgʲ] '(he) will announce', while others fail to do so contrary, e.g. *molaimíd* [ˈmoləmʲiːdʲ] 'we praise'; for more details on such cases, see [21]. Other exceptions are lexical in the sense that the stress is unpredictable and does not obey the general laws outlined above. These are often found to exhibit anomalous behaviour in other Irish dialects as well, not only in the South, cf. *tobac* [təˈbak] 'tobacco' or *bricfeasta* [brʲikˈfʲastə] 'breakfast'.

Another class of exceptions seems to stem from the fact that certain consonants contribute to syllable weight. There are words with peninitial stress, where the first and third syllables are light and the second syllable contains a sequence /ax/, e.g. *bacach* [bəˈkax] 'lame; poor' [20]. I'll primarily concerned with this type of exceptions in this paper.

1.3. Exceptional /ax/

Exceptional primary stress falling on a syllable containing the sequence /ax/ in words like *bacach* are already mentioned by Henebry [7]. Loth [13], who worked on the Irish of Ballingeary in West Cork, is apparently the first author to observe that:

-   /ax/ can only be stressed in the second syllable if not surrounded by long vowels;
-   3rd person singular verbal suffix *-adh* in conditional (*conditionnel*) or past habitual (*imparfait*), pronounced as /ax/, is never stressed unlike the nominal suffix *-ach*;
-   in both nouns and adjectives with light syllables and /ax/ in the second syllable, the stress does not always fall on the second syllable, probably due to some consonantal clusters blocking its "forwarding" (cf. *cnocach* 'montagneux; hilly' or *fleascach* 'jeune homme; youth').

Sjoestedt [23] points out that in two-syllable nouns with a short vowel in the first syllable and *-ach(t)* in the second, the stress is on the second syllable in all cases when there is no /h/ or consonant cluster with a plosive or a sibilant and /r/ before the suffix *-(e)ach(t)*. Later, Blankenhorn [3] notes that the third

syllable with /ax/ does not attract stress. The approach that derives such exceptional stress placement from the properties of /ax/ and its inability to attract stress from other segmental properties of the word is later taken up in [1; 3; 4; 6]; details differ, however.

Gussmann [6] seems to be the first to suggest that exceptional stress on /ax/ might be due to properties of the vowel in the first syllable of such words. However, he rejects the presence of a phonologically reduced vowel there citing words like *fathach* 'giant' or *lathach* 'swamp' from West Muskerry, where "some speakers stress the second syllable even in this type of word" [16]. This possibility is later entertained by Green [5], who uses the constraint NON-HEAD(ə) penalising stress on an underlyingly reduced vowel on a par with PKPROM [24] to account for the special prosodic prominence of /ax/.

Iosad [9], following a conjecture by Ó Sé [20], suggests that peninitial stress in words with /ax/ might be synchronically due to the presence of a reduced vowel in the first syllable of such words, not the additional weight of syllables with /ax/ or any special properties of the vowel in the second syllable, citing the process of stress retraction that can occur in Munster Irish (see below). He concludes that the status of the vowel in the first syllable remains unclear and leaves it for further scrutiny.

2. ANALYSIS

2.1. Proposal: Underlying schwa

Developing the conjectures in [5; 9; 20], I claim that in words with exceptional stress on /ax/ in the second syllable, the first syllable contains a phonologically reduced vowel /ə/, which blocks the stress and makes it shift to the second syllable. This approach diverges from [5] in its treatment of /ax/. While Green argues for both the schwa in the first syllable and a special prominence of /ax/ in the second, I try to show that the latter condition can be effectively dispensed with. The former condition, however, is necessary to provide a unified account of words with peninitial stress on /ax/, adverbs of the type *anseo* [ənˈso] 'here' and inflected prepositions like *agam* 'at me' in their emphatic form, *agamsa* [əˈgumsə] 'at me!', which also do not allow initial stress (as well as words with /a/ in the second syllable in the absence of /x/).

I also present evidence in favour of the view that vowel reduction in GCD is not a unitary process: while /ə/ is present in the lexicon, there also exists a post-lexical process of vowel reduction.

2.2. Phonetic evidence

Let us suppose that in the first syllable of words like *bacach* [bəˈkax], a phonologically reduced vowel is present underlyingly, not a full vowel. We can then expect this phonological /ə/ to be reflected uniformly, providing a target for phonetic realizations; on the contrary, phonetic variability would be expected of a full vowel if it were present in the lexicon.

In 2014, I conducted a study with four speakers of GCD in the Corca Dhuibhne Gaeltacht. The speakers were presented with a reading questionnaire consisting of 64 words inside the carrier-phrase *Scríobh se* X *ar an mbord* 'He wrote X on the table'. X was replaced by words of the prosodic structure LˈH(X) with various combinations of vowels in the first and the second syllables. In the pronunciations drawn from the questionnaire, measurements of duration as well as of F_1 and F_2 for vowels of the first syllable before stressed /a/ and long vowels were performed manually using Praat [2].

The samples were tested for homogeneity using a non-parametric Wilcoxon rank sum criterion; if the distributions are not significantly different, then the segments must belong to a single class. The most significant results were shown by the division of vowels before the low stressed /a/ and /ɑː/ vs. before all other stressed long vowels, see Table 1 and a boxplot for duration in Figure 1.

Table 1: Wilcoxon criterion values and *p*-values for duration (sec.) and F_1 (Hz) before low vs. non-low V

Speaker		W value	*p*-value
1	*t*	603.5	0,0000005452
	F_1	576.5	0.005774
2	*t*	547	0,00001512
	F_1	458	0.000656
3	*t*	430.5	0,000002665
	F_1	393	0.0001414
4	*t*	297.5	0.0003465
	F_1	271	0.004272

Figure 1: Vowel duration (sec.) in prestressed syllable before low vs. non-low V across 4 speakers
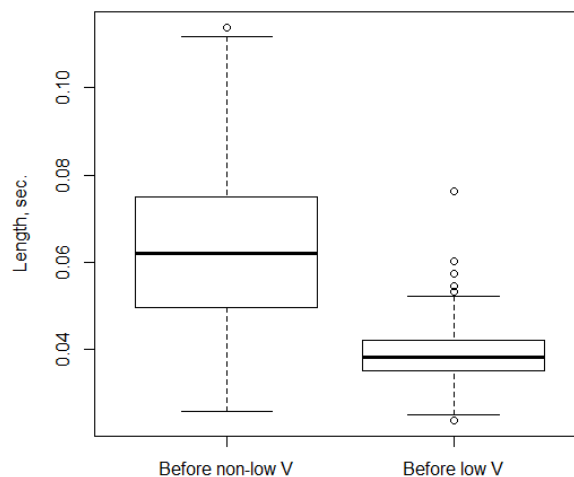
As Figure 1 demonstrates, the distribution of the durations of vowels in the first syllable before /a/ and

/ɑː/ is more compact than before all other stressed long vowels. The data also show that before stressed non-low long vowels of the second syllable, different short vowels are possible [a ɔ ʊ e ə]. Less variability is found before the stressed /ɑː/, where only [ə ɔ ʊ] are possible according to our data; see, however, examples with pre-stressed [a] in [20]. Before the stressed /a/, only the phonetic [ə] is possible, and all cases behave uniformly (with respect to F_1 and t, whereas F_2 is largely governed by the consonant environment as expected, see [10]). This surface distribution is compatible with the view that vowels of the first syllable preceding low vowels (including /a/) and those preceding other vowels represent two different categories, and while in one case we are dealing with an underlying /ə/, in the other case we see the effect of post-lexical centralization and reduction of full short vowels.

Another piece of evidence comes from another study of the acoustic characteristics of GCD vowels [12]. It shows that among unstressed vowels with duration of more than 100 ms one encounters mid vowels of spectral characteristics that cannot be found under stress. Unstressed vowels whose schwa-like formant characteristics remain stable even with an increased duration are unlikely to have undergone centralization caused by shortening, but probably represent the phonological reduced vowel. As this study shows, a similar phonetic behaviour with respect to duration and quality is shown by vowels in the first syllable of words with /ax/ and other exceptions like *anseo* [ənˈso] 'here' etc.

2.3. Phonological arguments

The first argument in favour of an underlying vowel in the first syllable and against a special status of /ax/ is provided by words where stress falls on the first syllable in spite of the presence of /ax/ in the second. Not only do abstract names demonstrate such a stress pattern [6], but there are also adjectives like *cnocach* [ˈknʊkəx] 'hilly' with stress on the first syllable and no consonantal cluster or any intervening segment to hinder stress "forwarding". Even if the generalization with respect to /ax/ and its exceptional prominence is true, this trend may be reversed in specific lexemes.

Second, in the course of the experiment described in Section 2.2 it turned out that some words taken from Ó Dónaill's [17] dictionary were unfamiliar to some participants, e.g. *bogach* 'soft, boggy ground', *paiteach* 'chubby little boy'. Subsequently, these words were all excluded from consideration, but as they uttered unfamiliar words the speakers always stressed the first syllable. This suggests that the prominence of the combination /ax/, which can easily be inferred on the basis of spelling, is not constant.

The third argument is provided by the process of stress retraction. It involves leftward replacement of lexical stress in certain words when the distance between the underlying stressed syllable in them and the stressed syllable (trigger) in the immediately following words within an intonational phrase is less than two morae, cf. the word *corcán* [kərˈkɑːn] 'pot' in the phrase *corcán mór* [ˌkɔrkɑːnˈmuːər] 'big pot'. According to the field data collected in 2012–2016 on the Dingle peninsula as well as examples in [20], all words of the type Lax(X) forbid retraction, e.g. *bodach mór* *[ˌbɔdəxˈmuːər] 'bigwig'.

Vowel reduction neutralises the opposition in vowel height, but stress retraction restores the quality of the vowel. Thus, Bennett [1], who touches on this issue, concludes that vowel reduction and stress retraction are both post-lexical processes and that stress retraction precedes vowel reduction. In words like *bodach*, the ban on stress retraction contradicts this ordering of processes. A way out of this stalemate is to posit a phonologically reduced vowel /ə/ in the first syllable of words where it cannot host the retracted stress and where it surface behaviour conforms to the pattern described in Section 2.2. This allows to derive stress placement in words with /ax/ in the second syllable as well as in adverbs like *anseo* [ənˈso] 'here' and inflected prepositions like *agamsa* [əˈgumsə] 'at me!'.

An analysis of GCD in OT-terms is not the focus of the present paper, but it should be briefly noted that the avoidance of stress on /ə/ could be modelled by a constraint like NON-HEAD(ə) used in [5].

3. ALTERNATIVE APPROACHES

Approaches that rely on the properties of /ax/ itself seem to face some challenges that the current proposal allows to circumvent.

In Blankenhorn's analysis [3], when found in the coda, the consonants /s ʃ x/ extend syllable length but not enough to make the syllable as long as one with a phonologically long vowel. Therefore /ax/ is longer than the first syllables if the latter does not contain certain consonant clusters. It remains unclear why, if this is the case, the combination of /ax/ but not /as/ or /aʃ/ attracts exceptional stress and what determines the effect of the consonant /h/, whose effect on the duration of the syllable she calls immaterial but which, according to [3; 23], blocks stress on /ax/.

The division of syllables into three categories according to their weight—syllables with short vowels, /ax/, and long vowels—is adopted by Doherty [4] in his metrical analysis of stress. He claims that syllables with /ax/ belong to the class of light syllables but cannot be found in a weak position within the trochaic foot. This analysis, however, has

difficulties coping with words of the structure LaxH and also equates all words with /ax/ to each other.

Providing a similar metrical analysis, Gussmann [6] discusses the problem of syllabification that all such approaches face. The words *bacach* [bəˈkax] 'poor (sg.)' and *bacaha* [bəˈkaxə] 'poor (pl.)' both have peninitial stress, although in the VCV position one would expect the consonant to constitute the onset of the second of the two syllables. As for the words with a stressed /ax/ in the second syllable, Gussmann attributes their behaviour to the properties of the vowel /a/, which merely happens to precede the spirant /x/ for historical reasons.

Bennett [1] argues for the prominence of /ax/ sequences and the special status of /x/. He cites three pieces of evidence to support this view.

1. The vowel /a/ does not centralize in unstressed position before /x/ in Ulster and Achill dialects, which suggests that /ax/ is more prosodically prominent than other sequences of the type /aC/. It should be noted, however, that the short /a/ is sometimes not subject to reduction even if followed by consonants other that /x/ in Ulster and other dialects, e.g. *macalla* [maˈkalə] 'echo'. Also, in Ulster and Achill an /a/ followed by a /x/ in the *third* syllable resists centralization on a par with /ax/ in the second syllable, e.g. *leitheadach* [ˈlʲehədɑx] 'arrogant', and ignores morphology, e.g. *iascaireacht* [ˈiəskərʲɑxt] 'fishing' (from [24]), while it does not attract stress in Munster dialects.

2. Bennett's second argument for the special status of /ax/ is drawn from fact that this sequence, when in the second syllable, attracts stress in Munster Irish. Yet this argument appears to be cyclic in nature: on the one hand, /ax/ attracts stress *because* it is a prosodically marked sequence with a moraic consonant; on the other hand, /ax/ *is* a prosodically marked sequence supporting two morae because it attracts stress, since no other evidence internal to Munster Irish seems to be available to support its prosodically prominent status.

3. The same criticism applies partially to Bennett's observation that /x/ in intervocalic position might be the coda of the left syllable linked to a mora, since he points to the irregular stress in Munster Irish, citing [4], as his primary evidence. At the same time, it is the case that [14; 15] do find that Irish speakers can assign a consonant in an intervocalic position after a short stressed vowel to both the left or the right syllable, which is echoed by the dispreference for /Cx/ clusters. What's more, /x/ only appears in word-initial position in morphologically derived contexts as a result of the lenition of /k/.

4. Bennett further points out that /x/ shares two to three features with the vowel /a/ and can be considered its glide-like counterpart, so that the sequence /ax/ behaves like a diphthong including its

distribution with respect to lexical stress unlike all other VC, aC, or Vx sequences. However, syllables with diphthongs do bear stress in the second syllable surrounded by heavy syllables and attract stress in the third syllable like syllables with long vowels [20], whereas the /ax/ sequence does not. According to Bennett, all other homogenous VC sequences like /uv/ or /ij/ do not behave in a similar way because of the exceptional sonority of /a/, which is manifested by its greater duration and intensity in phonetic terms. This takes us back to a proposal by Ó Sé [21], who finds an explanation for this anomaly in the fact that in many languages low vowels tend to have longer duration and greater intensity than other vowels.

4. DISCUSSION

I have tried to show that the optimal way to describe irregular peninitial stress in words with /ax/ in the second syllable boils down to the presence of a phonologically reduced vowel in the initial syllable, which cannot take lexical stress and which is contrasted with vowels resulting from the process of post-lexical process of vowel reduction. The sequence /ax/ itself is therefore synchronically irrelevant for determining stress placement. Such an approach, however, can raise several objections.

Firstly, it leads to positing segmental alternations like /ə/ *bacach* 'beggar' ~ /a/ *bacaigh* 'beggars'. However, similar vowel alternations are observed in various parts of the GCD lexical system, so the case above does not present a striking exception to what is found elsewhere, cf. the alternation /a/ *lag* 'weak' ~ /i/ *(níos) laige* 'weaker' [20].

Secondly, the vowel /a/ does avoid reduction in Ulster, especially when followed by /x/, see [19] and above. Yet if historically the cause of this failure to reduce in Ulster dialect and non-standard stress placement in Munster dialect is the nature of the vowel /a/, this does not contradict the synchronic analysis. It is possible that /ə/ was phonologised before low vowels after the "forwarding" of stress and the fixation of syllable weight system.

As for historical reasons for the behaviour of /ax/, one could point to O'Rahilly [18], who writes that in the two suffixes *-ach-* and *-ech-*, where the vowels are derived from *ā* and *jā* respectively, a full vowel was preserved in Middle Irish, which is reflected in the fact that /ax/ in the second syllable resists reduction in other dialects. This point of view is supported by Jackson [11], who assumes that the second syllable with *-(e)ach(t)* preserves the historical unreduced ("clear") vowel /a/. The reason why this particular vowel was shortened and whether that is related to syllabification facts observed in [14; 15], however, is not exclusively problematic for the current proposal.

5. ACKNOWLEDGEMENTS

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