Bridging the gap

Length and tenseness in Brythonic vowels

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ARGUMENT

- Vowel length and tense/lax quality are closely linked in modern Brythonic
- Tensing and laxing can be shown to interact with lengthening and shortening also diachronically
- Closer attention to tense and lax qualities can inform our reconstruction of the evolution of quantity
- Proposal: penult vowels were lax before they were lengthened in (some dialects of) Welsh

1 The phonology of length and tenseness

1.1 Welsh

THE WELSH QUANTITY SYSTEM

- Fairly well understood (Jones 1971, 1984, Awbery 1984, Ball & Williams 2001)
- Short vs. long vowels distinct in final stressed syllables, including monosyllables: *ton* 'wave' $\neq$ *tôn* 'tune'
- Additional distinctions:
  - Vowel quality: [tʰoːn] $\neq$ [tʰɔn] (Mayr & Davies 2011)
  - Duration of consonants: [ˈtʰoːn] $\neq$ [ˈtʰɔnˑ] (A. R. Thomas 1966, Grawunder, Asmus & Anderson 2015)
- Vowel quality: *basically*, long vowels are tense, short vowels are lax

North Welsh

- Length distinction neutralized in stressed penults: *tonnau = tonau* [ˈtʰɔna]

Is the consonant long?
- Really we don't know
- Perhaps: comments on at least fortis stops /p t k/ (Fynes-Clinton 1913, Sommerfelt 1925)
- Difficult to be sure if there is no contrast

- Not very much on the quality of penult vowels!

South Welsh

- Length distinction in stressed penults: *tonnau* [ˈtʰɔnˑɛ] ≠ *tonau* [ˈtʰoˑnɛ]
- Consonants are long after short vowels (Awbery 1986, C. H. Thomas 1993, Iosad 2017)
- Same kind of quality distinction
- Except in Pembs/SW Cards/W Carms: [ɛː ɔː] are obligatory before a high vowel in the next syllable

Unanswered questions

- What is the quality pattern in the north?
- What is the consonant duration in the north?
- What is the role *consonant* duration in perception? What are native-speaking fieldworkers attuned to?
- A. R. Thomas (2000): length written for vowels when distinctive, for consonants *never*
- How/why are mid vowels different from high vowels?

1.2   Breton

Quantity system in KLT

- Vowels can be short and long in stressed penults
- Duration: complementary length with consonants (e. g. Bothorel 1982)

(1)   St-Pol-de-Léon (Sommerfelt 1978)

   a.   [ˈaːlan]   *anal*   'breath'

   b.   [ˈɡalːut]   *gallout*   'to be able'

- Essentially South Welsh, with slightly different consonant conditioning
- Duration in final vs. penultimate long vowels: *???*
- ☞ Bothorel (1982) shows similar duration, but literally in three words

Vowel quality and length

- The tenseness is less prominent in literature
- Normally no quality differences noted between long and short [i u a]
- Often three distinct heights in the mid region (Jackson 1967): /e ɛ æ/ etc.
- Alternations in mid vowels (Anderson 1981): short is mid, long is lax

(2) a.   [ˈalxwɛs]   *alc'houez*   'key'

    b.   [alxˈweːzi]   *alc'houezañ*   'to lock'

    c.   [ˈjeːn]   *yen*   'cold'

    d.   [ˈjɛnːox]   *yenoc'h*   'colder'

- Unlike Welsh, 'laxer' vowels can be long
- This happens if they are secondarily lengthened short vowels
    - After [w]-vocalization: [ˈdɛːro] 'cook' 'oak'
    - ☞ Contrast in Welsh [ˈdeːru] *derw*
    - After *ae > e: [ˈbɛːlɛk] 'priest', MBr *baelec*
    - From *ez: [ˈlɛːr] 'strap', MBr *lezr*
    - Lengthening before svarabhakti vowel: [ˈæːrax] 'snow' *erc'h*
    - ☞ Contrast in Welsh [ˈkeːvɛn], *[kɛːvɛn] *cefn*

1.3   Unstressed syllables

Welsh

- Always short phonologically
- Unstressed final vowels are phonetically long
- Classic problem in Welsh phonology: final syllable seems to be more prominent than the stressed syllable (Watkins 1976, Bosch 1996)
- Generally assumed that final unstressed syllables support a *smaller* range of contrasts
    - ☞ No vowel length
    - ☞ No [ə] ('vowel mutation')
- *However*: unstressed syllables allow for a *distinction* between tense and lax short vowels

(3) a.   [ˈkoːdi]   *codi*   'rise'

    b.   [ˈgeːlɪn]   *gelyn*   'enemy'

- *High* vowels: tense if open, lax if closed
- *Mid* vowels: no consensus
- Mostly 'free variation', at least in open syllables
- More variation in quality
- [ɛ] merges with [a] in many dialects
- Iosad (2017): tenseness in Welsh may be driven not by length but by *syllable-final* position
- Consistent also with tenseness in unstressed hiatus

(4) Pemrokeshire (Awbery 1986)

    a.   [miˈɛːvɪn]   *Mehefin*   'July'

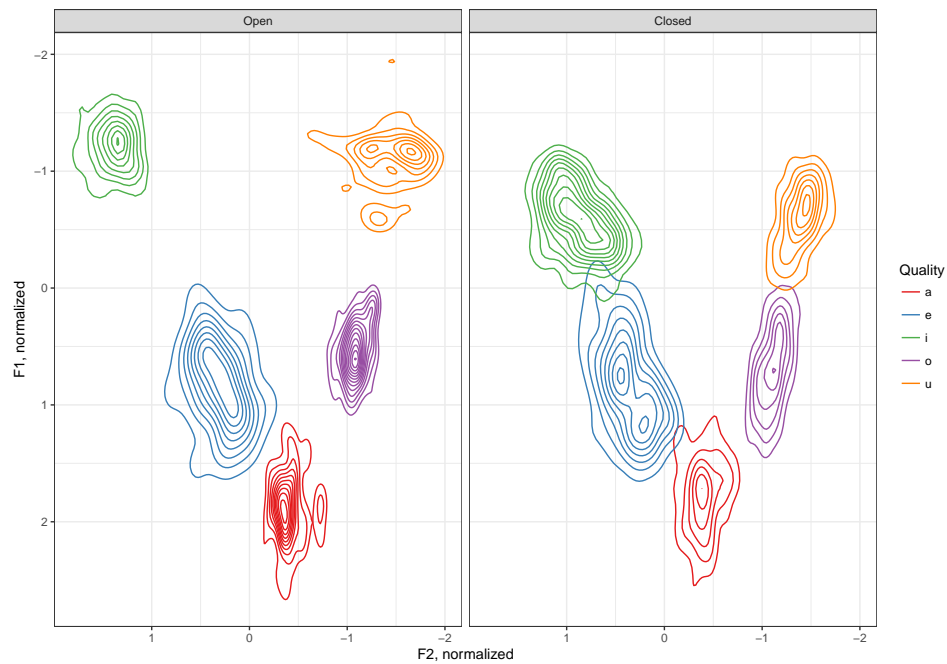   b.   [r̥eˈoːlɛ]   *rheolau*   'rules'

Figure 1: Qualities of final unstressed syllables by syllable type, South Welsh

2   Historical interpretation

2.1   The development of length

THE BASICS

- Final stressed syllables: New Quantity System (Jackson 1953, Schrijver 1995, McCone 1996)

(5)   a.   *senos > *sénos > hen [heːn] 'old'

    b.   *pennos > *pénnos > pen [pɛnː] 'head'

- Short and long vowels may have been qualitatively different

Schrijver (1995: 24–25)
'[T]he quantitative oppositions between long and short vowels [in early PBr] were lost, and as a result of this loss the qualitative differences between the old long and short vowels, where originally were non-phonemic, attained phonemic status'

(6)   a.   *bitus > *bɪːd > byd [bɨːd] (North Welsh)

    b.   *dūnom > *dīnon > *diːn > din [diːn]

2.2 Pretonic syllables

Length in pretonic syllables

- Schrijver (1995, 2011): unstressed vowels shorten in pre-pretonic and closed pretonic syllables
- Open pretonic syllables: *focus here*
- Schrijver (1995, 2011): these have the same system as stressed syllables
- Schrijver (2011): open pretonic syllables are the last to lose traces of the old system (in Welsh)

(7)   *ɔ̄ > ɔ > o

    a.   *au-beros > *ɔßer > ofer* 'vain' (but Br *euver*)

Schrijver (1995: 253)
'It seems possible, although by no means certain, that when the stress was still on the final syllable in late PBr., quantitative differences could occur in the — then unstressed — penultimate syllable: OW [llȳ'dān], [gwĭnn'lănn]… It is impossible to decide whether Breton has innovated by lengthening the vowel of the penultimate or Welsh has innovated by shortening it.'

- Evidence for *qualitative* difference between open pretonic and other unstressed syllables
- What about the evidence for *quantitative* difference?

Accent shift

- Accent shift from the final syllable onto the penult (Watkins 1972, Schrijver 1998)
- Vowels in final syllables become phonologically short

(8)   a.   *o'veːr (or is it *ɔ'vɛːr?) > *ofer* ['oːvɛr]

    b.   or is it ['ɔvɛr]?

- Final fortis consonants eventually shorten
- What were the qualities of the pretonic vowel that the stress shifted onto?

3 Length and (re)tensing

3.1 Typology of lengthening and tenseness

Typology of tensing and laxing

- Lengthening and shortening do not *have* to lead to tensing and laxing, but they *can*
- Lengthening
    - Tensing: Old Norse *vita* 'know' > Faroese [viːtɐ]
    - No tensing: Icelandic [vɪːta]; cf. Breton above
- Shortening
    - Laxing: Old Norse *hvítt* 'white-NEUT.SG' > Swedish [vɪtt]
    - No laxing: Scottish Vowel Length Rule (*bīt* 'beat' > *bit*)

Stress to weight in Brythonic

- *Any* account of accent shift and NQS in penults has to recognize lengthening of originally short vowels

(9) *abonā* > *[aˈβoːn] / *[aˈβɔːn]? > [ˈaːvɔn]

- 'By analogy' with the bimoraic requirement in stressed syllables: general stress-to-weight rule (Prince 1992, Bye & de Lacy 2008)
- *Some* long consonants after penult stressed vowels are lengthened secondarily, notably after [ə] (*llydan*, *byddar*)
- Unclear if concurrent with vowel lengthening

3.2 Consonant length and the quantity system

What happened to consonant length?

- Complementary V/C length in final stressed syllables is PBr
- Long consonants in newly unstressed final syllables: lost after accent shift
- ☞ Probably as early as the 9th century to judge by *trwm ac ysgafn* rhymes (Sims-Williams 2016): *afon* ∼ *calon* < *calonn*

When did post-tonic consonants lengthen?

- Some long post-tonic consonants are old

(10) a. **kalonn* > *calon* 'heart'

  b. **kalonn + ewes* > *calonnau* 'hearts'

- But not all?
- Welsh: one of the things I want to know
- One piece of evidence: Pembrokeshire (Awbery 1986, Wmffre 2003)
- Sound change [ə] > [i], length of [i] depends on historic length of following consonant

(11) a. *i fynydd* > [ˈviˑni] 'up'

  b. *cynnes* > [ˈkɪnˑɛs] 'warm'

- No neutralization of *ynV* ∼ *ynnV*: no general lengthening after [ə] before [ə] > [i]
- Consonant lengthening is late?

The North Welsh system

- How old is the North Welsh system?

  Wmffre (2003)
    – Evidence for quantity distinctions in penults in 16th century Flintshire, probably in vowels
    – No secondary lengthening of either V or C in Middle Welsh, only historical C length
    – Early Modern period: lengthening of vowels → South Welsh system
    – Even later shortening of vowels to produce North Welsh

☞ The situation with consonants in North Welsh is unclear
- Considerable uncertainty around the quality of penults in North Welsh
- Either
    – Lengthening > Tensing (South Welsh) > Shortening (North Welsh)
    ☞ Then why aren't historically long vowels tense in the north? Unless they all laxed
    – Or: shortening in the north before the tensing came through
    – What was the original quality of the penults?

3.3   The rise of tensing

Breton

- Lax long vowels in *dero*, *ler*, *erc'h*
- Phonologization of laxness precedes
    – *w*-vocalization; Jackson (1967: §669ff.): late 15th to late 16th century
    – *ð*-vocalization; Jackson (1967: §711ff.): lengthening from late 15th century?
    – Svarabhakti: difficult to date, may be a sporadic tendency throughout
- Phonologization of laxness follows penultimate lengthening
- Tense ∼ lax distinction established quite early on

Mid Wales

- Lewis (1960), northern Ceredigion: no difference at all between short and long [i u]
- Free variation between VCC and VVC in penults
- Pilch (1957), Bow Street: does not write length of either vowels or consonants, only tenseness
- Suggestive: /hen/ *hen* (long [eː]), /mɛðɪg/ *meddyg* (long [ɛː]? Or a northern variety?)
- Wmffre (2003): numerous references to tensing and laxing, lengthening and shortening but no overall picture

Further evidence

- Iosad (2017): data includes one speaker from Aberystwyth
- Disyllables only
    – Quantity difference between short and long penults: as in south Welsh
    – (Although differences less pronounced)
    – No quality difference between short and long penults: [i(ː) u(ː) ɛ(ː) ɔ(ː)]
    – Usual distinction between word-final [i u] vs. [ɪ ʊ] in closed final syllable
- Quite dissimilar to other familiar systems: possible fieldworker confusion?

Corpus study

- Paldaruo crowdsourced acoustic corpus (Cooper, Chan & Jones 2015)
- Three speakers stating Welsh as first language, gone to Ysgol Penweddig
- Preliminary study: selected relevant tokens that are not obviously spelling pronunciations
- 342 tokens for now
- Good quality recordings! Manual mark-up, automatic formant measurement in Praat
- F1 and F2, averaged over the 40% to 60% of duration interval
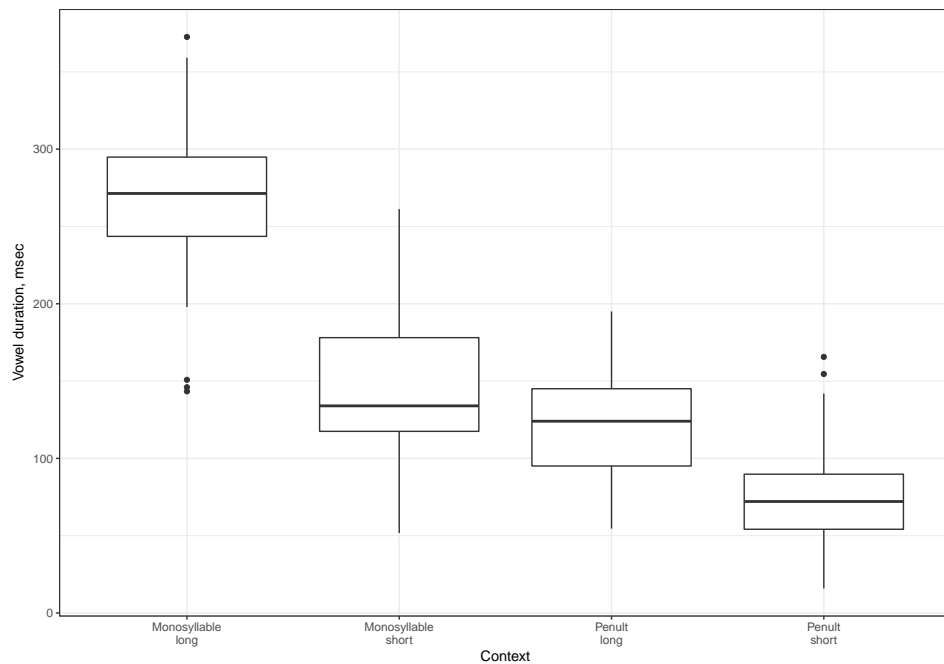

Figure 2: Vowel durations, Mid Wales speakers

```
fit <- lmer(v1_f1_n ~ v1 + v1_long*monosyl
            + v1_long*v1_dur +
            (1|speaker) + (1|word),
            df)
```

- Quantitative system: like South Welsh
- Qualitative system
  - Like the rest of Welsh in final syllables
  - In penults, at least the mid vowels are lax

Final syllables and the scope of tenseness

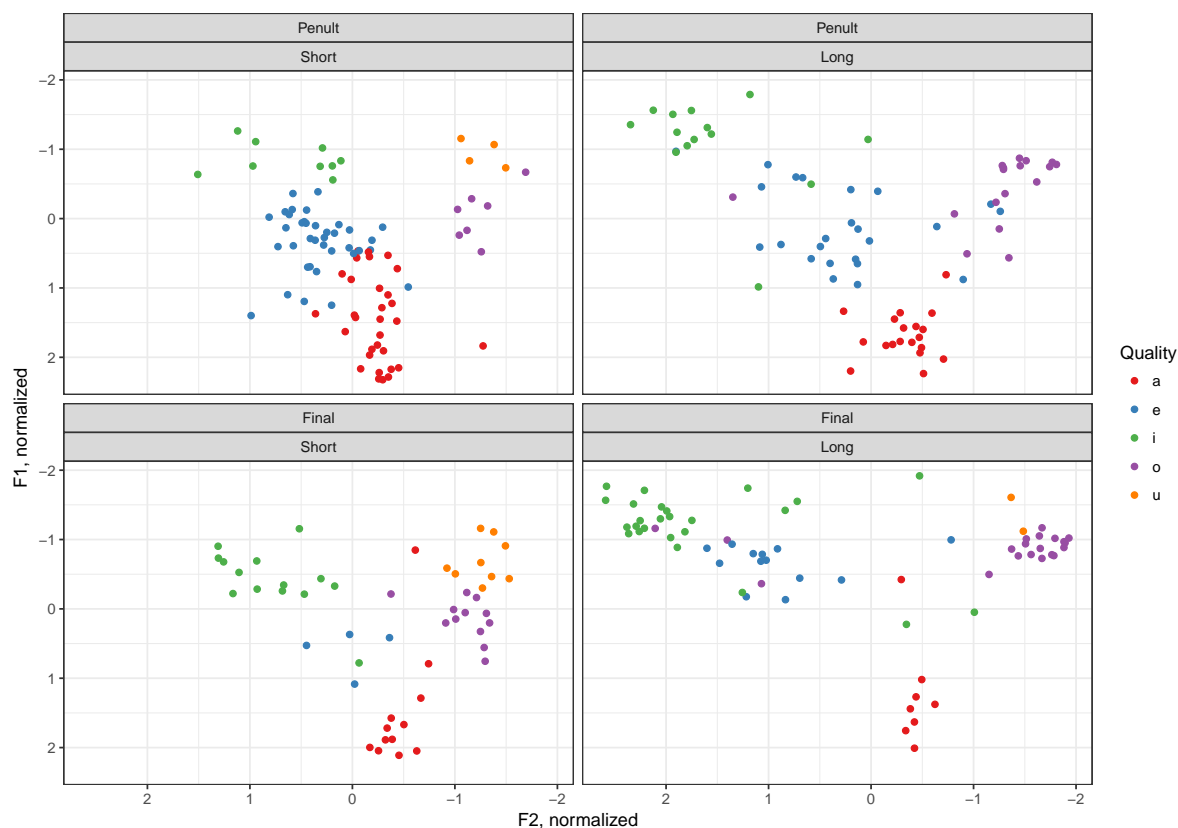- Same system as elsewhere: [i u] word-finally, [ɪ ʊ] in closed syllables

Figure 3: Vowel qualities, Mid Wales speakers

- Preliminary result: the tenseness contrast appears first in *final syllables*, irrespective of stress and length
☞ Also in Breton? Albeit with mid vowels
- Rule generalization (Kiparsky 1982, Robinson 1976, Ramsammy 2015): from word-final to syllable-final tensing?

4 Conclusions

Tensing in Welsh

- Penult vowels before lengthening may have been lax
- Tensing lags behind lengthening in penults
    - Mid Wales pattern: new quantity pattern but no tensing
    - South-West Wales pattern: following high vowels block tensing/raising
    - Variation in North Wales vowel quality: lengthening did not happen, tensing failed to apply *a fortiori*?
    ☞ No need for Duke-of-York scenario in North Welsh?
    - But we need to know the durational pattern of penult vowels followed by historically lenis consonants to be sure
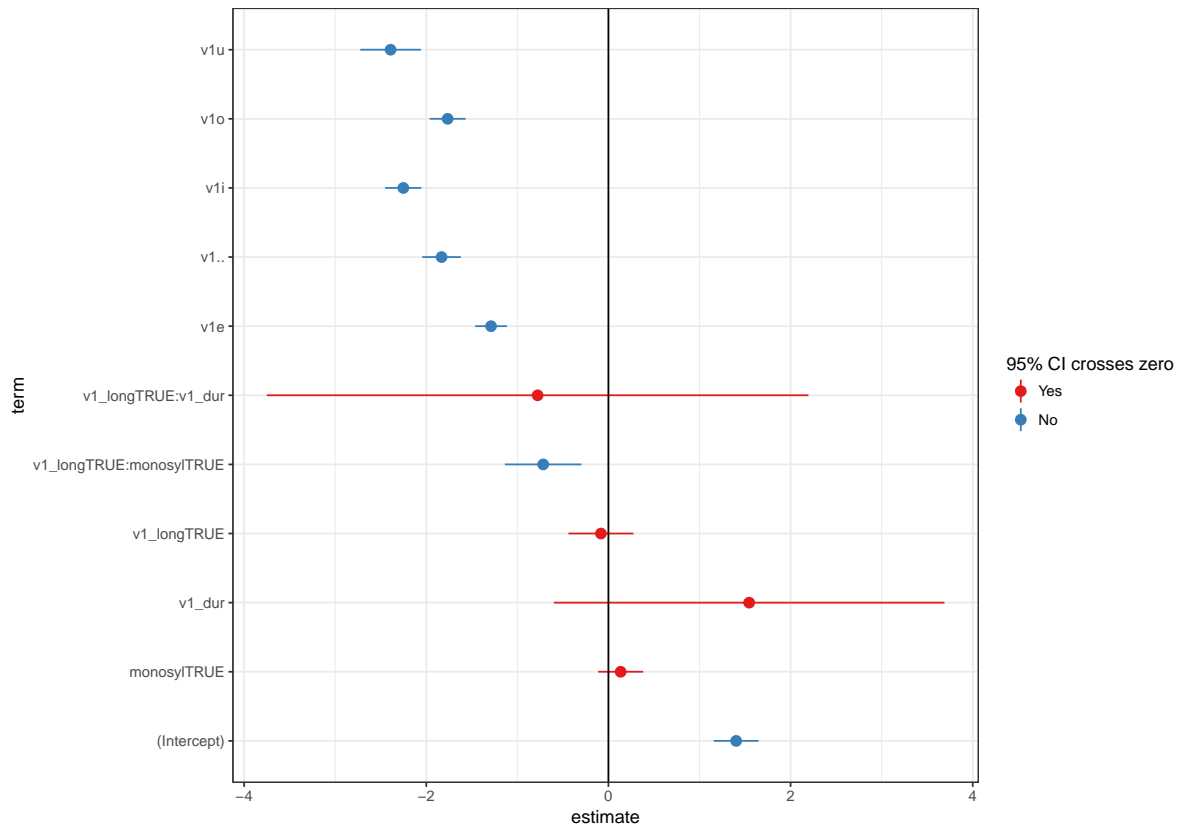
Figure 4: Estimated effects in the model

Tensing across Brythonic

- Despite apparently similar quantitative systems, significant variation in how quantity interacts with tenseness across Brythonic
- Breton
  - Tenseness distinction is fairly old
  - Establishment of tenseness precedes lengthening processes
  - Focus on mid vowels
- Welsh
  - (Vowel) lengthening more recent?
  - Tensing even more recent still
  - Focus on high vowels
  - (Some) North Welsh dialects may never have undergone penult lengthening
- Pan-Brythonic isoglosses?

Methodological conclusions

- More detailed phonetic study gives a better picture of the vowel systems than in traditional descriptions
- We need to disentangle

- – Tense ∼ lax
- – Long ∼ short vowels
- – Long ∼ short consonants
- – … Cf. Rees this session
- They coincide in some dialects but likely not in others
- Instrumental phonetics and phonological analysis for comparative reconstruction

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