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Northern Welsh

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Northern Welsh is one of two main dialect families of Welsh (cym, ISO 693-3) spoken in Wales, the other being Southern Welsh. The Welsh counties of Anglesey, Gwynedd, Conwy, Denbighshire, Flintshire, and Wrexham in the United Kingdom are considered to comprise the unofficial region of North Wales shown in Figure 1 (as designated by StatsWales 2018). Within this area there are further dialectal differences that are beyond the scope of this analysis, which considers the general features of Northern Welsh as a whole. However, see Thomas & Thomas (1989) for an overview of differences between eastern and western varieties of Northern Welsh.

Welsh is a Brittonic Celtic language, more closely related to Cornish and Breton than to Celtic languages in the Goidelic branch: Manx, Irish, and Scottish Gaelic (Ball & Fife 1993). Like all Celtic languages, Welsh has verb-initial word order and a system of initial consonant mutation. Initial consonant mutation is the remnant of historic sandhi processes which conditioned predictable phonological alternations. Today, the phonological triggers for these alternations are opaque or absent, and mutation is best described as a morpho-phonological process that is found in a small set of lexical items and syntactic patterns (see section 'Mutation' below for further detail).

Phonetic description of Welsh has a long history, notably Sweet (1882) and S. Jones (1926). More recent work includes a description of the vocalic system (G. E. Jones 1971, 1972), a description of Welsh stress (B. Williams 1999), a collected volume reporting a

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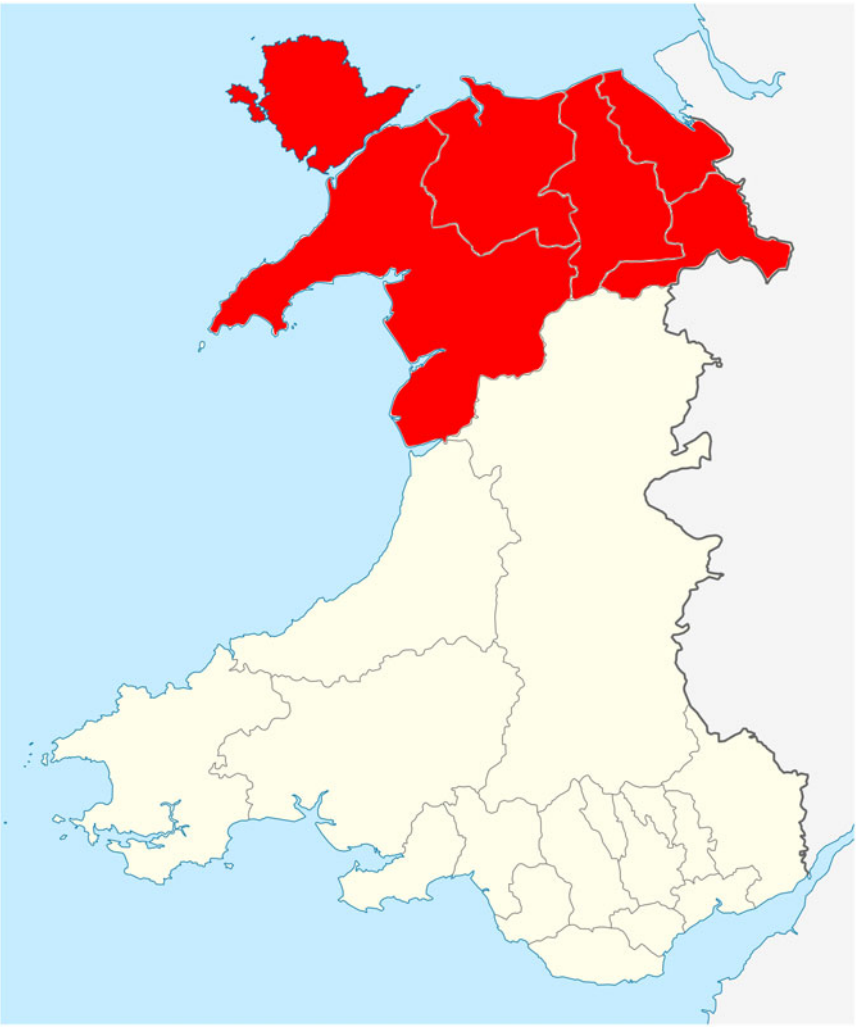

Figure 1 (Colour online) Wales, the counties of North Wales (left to right: Anglesey, Gwynedd, Conwy, Denbighshire, Flintshire, and Wrexham) are highlighted. (Modified from 'Wales Location Map' by NordNordWest, used under CC BY-SA 3.0, via Wikimedia Commons.)

variety of acoustic investigations of Welsh (Ball & Williams 2001), and a discussion of the phonological representations of Welsh vowels (Iosad 2017). Phonological descriptions of Welsh include Ball & Jones (1984) and Hannahs (2013). Readers are also referred to socio-phonetic work that has documented dialect differences in the Welsh vocalic system (Mayr & Davies 2011), investigated the realization of /l/ in Welsh–English bilingual speech (Morris 2017), and described pre-aspiration in Bethesda Welsh (Morris & Hejná 2020).

Since the 1960s, revitalization efforts including the Welsh language acts passed in 1967 and 1993 and local *Mentrau Iaith*, or language initiatives, have succeeded in maintaining Wales as a *de facto* and *de jure* bilingual nation (Morgan 2001). The requirement that all schoolchildren in Wales receive education in the language and the development of comprehensive Welsh-medium and bilingual educational programs through university level have also been of critical importance in maintenance of the language (C. H. Williams 2014). In 2020, 279,300 (41.1%) of the 680,100 residents of North Wales age three and over reported being able to speak Welsh (with a greater density of speakers in the western part of the region

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than in eastern areas); the same year, in the nation as a whole, 883,600 out of 3,039,900 residents age three and over (29.1%) reported being able to speak Welsh (StatsWales 2020). The language background of self-identified Welsh speakers in the census data includes those who speak it as a first language acquired at home, and those who learned the language in a formal educational setting. Information about differences in language acquisition, and therefore proportion of first and second language Welsh speakers, was unavailable. Though it is beyond the scope of this paper, see M. C. Jones (1994, 1998) for an investigation of the tendency of younger speakers from Welsh-speaking homes toward a standard variety of Welsh over local varieties in eastern areas of the country and H. M. Jones (2008) for an overview of recent statistical trends in family transmission of the language.

Recorded tokens and associated spectrograms presented in this Illustration are primarily from recordings of her own voice made by Catrin Lliar Jones. Catrin is a native speaker of Northern Welsh (bilingual with English and age 47 at the time of recording), who was born and raised on the Llŷn Peninsula in the county of Gwynedd. Tokens were recorded at a 44100 Hz sampling rate using a Snowball table microphone and a PC computer running Audacity. No preamplifier was used. Additional data, reported in the aggregate below, was collected from recordings of five other female speakers of Northern Welsh. All supplementary speakers were from the county of Gwynedd or Anglesey and reported acquiring Welsh from birth. These participants wore a head-mounted Countryman E6 Omnidirectional microphone plugged into a Yamaha MG124c preamplifier, and digital recordings were made with an HP ProBook 6470b laptop.

Consonants

	Bilabial	Labio-dental	Dental	Alveolar	Post-alveolar or Palatal	Velar	Glottal
Plosive[i, ii]	pʰ p			tʰ t		kʰ k	
Affricate					tʃ dʒ		
Nasal	m			n		ŋ	
Trill				r̥ r			
Fricative[iii]		f v	θ ð	s	ʃ	x	h
Lateral fricative				ɬ			
Approximant	w				j		
Lateral approximant				l			

[i] We represent the contrast between fortis and lenis plosives as one of aspiration to align with our consultant's productions. Recent work has described the Welsh lenis plosives as unaspirated and variably voiced (G. E. Jones 1984: 41; Hannahs 2013: 15; Morris & Hejná 2020). See 'Plosives' section for more information.

[ii] We follow Hannahs (2013: Chapter 2) in describing /tʰ/ and /t/ as alveolar, although other sources describe the coronal plosives as variant between dental and alveolar place of articulation in Northern Welsh (Dowdell 1991, Ball & Williams 2001, Penhallurick 2008). Our consultant's productions were rarely dental.

[iii] Although the Welsh dorsal voiceless fricative is often described as uvular /χ/, we use velar /x/ here to represent the fricative as produced by our consultant.

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/pʰ/	pʰɛn	*pen*	head
/p/	ˈpɛn̪ˌiθ	*bendith*	blessing
/tʰ/	ˈtsʰɛnɐ	*tenau*	thin
/t/	ˈtɛnɨ	*denu*	to attract
/kʰ/	ˈkʰɛnɐ	*cenau*	cub
/k/	k̟eːn[1]	*gên*	jaw [2]
/tʃ/	ˈtʃʰeinɐ	*Tsieina*	China* [3]
/dʒ/	ˈtʃeliː	*jeli*	jelly*
/m/	ˈmentsʰɛr̥	*menter*	initiative
/n/	ˈnɛnvuˌ	*nenfwd*	ceiling
/ŋ/	ˈʔɐŋɛn	*angen*	need
/ŋ/	əŋ ŋeːm	*yng ngêm* [*dydd Gwener*]	in [Friday's] game
/r/	reːns	*rêns*	reins*
/r̥/	r̥heːn	*rhên*	ruler
/f/	ˈfɛnɛst	*ffenestr*	window
/v/	ˈvɛnɪs	*Fenis*	Venice*
/θ/	ˈθemɐ	*thema*	theme*
/ð/	i ˈð̥ɛnɨ	*i ddenu*	to attract
/s/	ˈsɛnɛð̥	*senedd*	senate
/ʃ/	ʃɛˌ	*sied*	shed*
/x/	ˈɬexɛn	*llechen*	slate
/x/	ei ˈxenɐ	*ei chenau*	her cub
/h/	heːn	*hen*	old
/l/	lɛns	*lens*	lens*
/ɬ/	ɬɛn	*llen*	curtain
/w/	ei ˈwenki	*ei wenci*	his weasel
/j/	ˈjɛxɨt	*iechyd*	health

All consonants can be found in initial position, although /ŋ/ only appears word-initially as a result of initial consonant mutation (see 'Nasals' section).

[1] Thanks to an anonymous reviewer for pointing out that this token shows voicing of the initial stop.
[2] Due to a recording error, the recording provided for this item is from an alternate speaker, a 30-year-old female native speaker of Northern Welsh from Caernarfon in the county of Gwynedd.
[3] Throughout the present Illustration, an asterisk (∗) marks lexical items borrowed from English.

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Plosives

Northern Welsh has a three-way place of articulation contrast among oral plosives: bilabial /p^h p/, alveolar /t^h t/ and velar /k^h k/. Previous work on Welsh has described the plosive contrast as primarily one of voicing, but our consultant seldom produced full voicing of lenis plosives, which has been previously described for Welsh (Ball 1984: 18; Hannahs 2013: Chapter 2). Thus, we have chosen to represent the primary contrast between homo-organic plosives as one of aspiration.

Fortis plosives are characterized by strong aspiration in all positions (G. E. Jones 1984 reports slightly weaker aspiration word-medially). Aspiration is generally greater for velar plosives than it is for alveolar and bilabial plosives, which has been documented for many other languages by Cho & Ladefoged (1999). Figure 2 shows mean and standard deviation

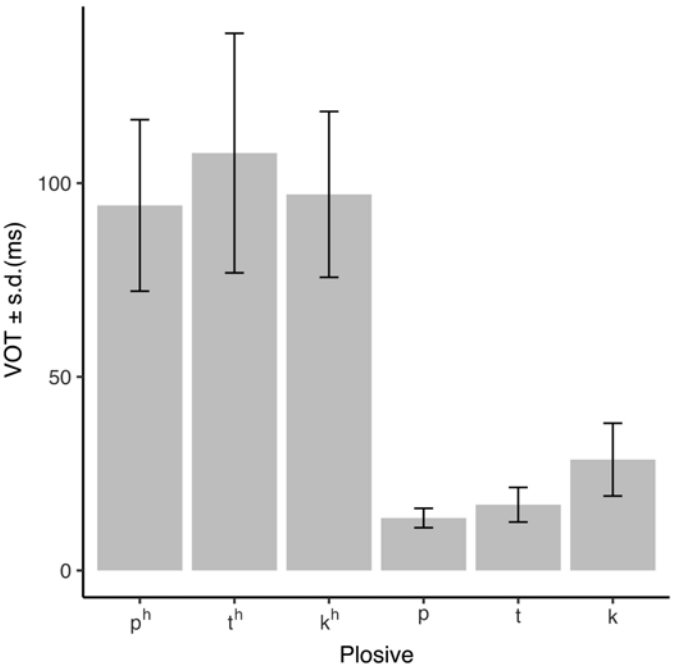

Figure 2 Voice onset times produced by five female native speakers of Northern Welsh in aspirated and unaspirated plosive-initial words from consonant list above (5 speakers × 6 consonants × 3 repetitions = 90 tokens used to produce the plot).

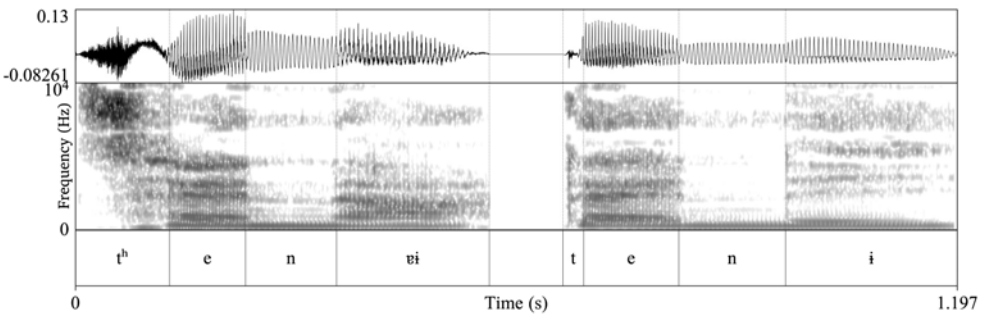

Figure 3 Spectrograms for initial fortis and lenis alveolar plosives: /t^h/ in /t^henɐi/ [ˈt^henɐ] *tenau* 'thin' (left) and /t/ in /teni/ [ˈteni] *denu* 'to attract' (right).

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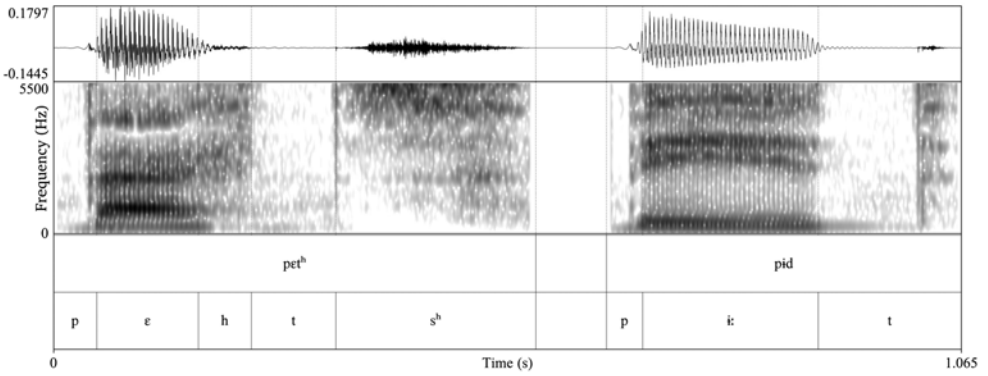

Figure 4 Spectrograms for alveolar plosives /tʰ/ and /t/ in word-final position. Fortis /tʰ/ in /pɛtʰ/ [pɛtsʰ] *bet* 'bet' (left) shows preaspiration before closure and burst, while lenis /t/ in /pɨːt̬/ *byd* 'world' shows only closure and a much shorter burst (right).

of voice-onset time measured in initial aspirated /pʰ tʰ kʰ/ and unaspirated /p t k/ plosives by five female native speakers of Northern Welsh (not including our primary consultant Catrin). Release of fortis plosives may verge on affrication (see /tʰɛnɐɨ/ [ˈtsʰɛnɐ] *tenau* 'thin', in Figure 3). Lenis plosives are unaspirated in initial position (Figure 3), and may exhibit voicing intervocalically and word-finally.

Pre-aspiration of both fortis and lenis consonants has been documented for Northern Welsh spoken in Bethesda (Morris & Hejná 2020). Pre-aspiration was observed in our speaker's production of post-vocalic fortis plosives (Figure 4).

Affricates

The voiceless and voiced palatal affricates /tʃ/ and /dʒ/ are non-native to Welsh but appear in a large number of words borrowed from English, such as /tʃeinɐ/ *Tsieina* 'China' and /dʒeli/ *jeli* 'jelly'. Although it is not part of the formal mutation system, /tʃ/ has been observed to undergo voicing in environments triggering soft mutation, as in /tʃʰɔklɛt/ *siocled* 'chocolate' > /ei tʃɔklɛt/ *ei jocled* 'his chocolate' (G. E. Jones 1984: 44–45; Hannahs 2013: 15–16). (NB: *siocled* may also be pronounced with an initial voiceless palatal fricative /ʃ/, in which case it does not undergo mutation.)

Nasals

Nasals have a three-way contrast in place of articulation: bilabial /m/, alveolar /n/, and velar /ŋ/. /ŋ/ appears word-initially only as a result of nasal mutation of the lenis velar plosive /k/ but is contrastive word-medially. Examples in (1) demonstrate intervocalic contrasts for the three voiced nasals.

(1)	/m/	/ɐmen/	[ˈʔɐːmɛn]	*amen*	amen
	/n/	/ɐnelɨ/	[ʔɐˈnɛlˠɨ]	*anelu*	to aim
	/ŋ/	/ɐŋel/	[ˈʔɐŋɛlˠ]	*angel*	angel

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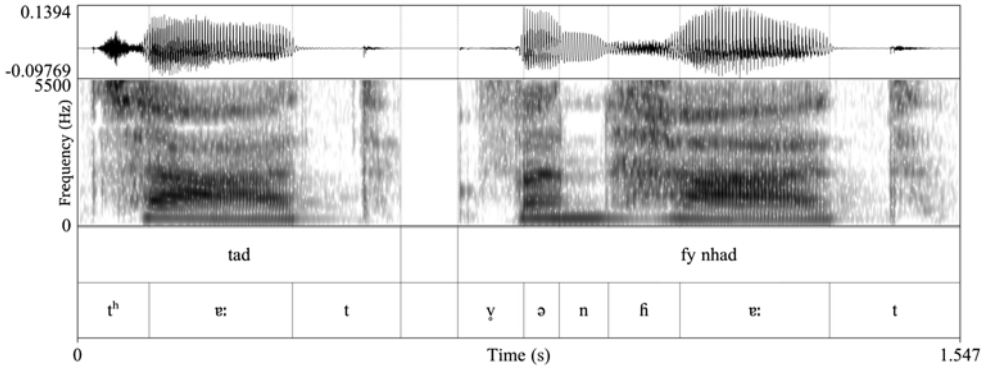

Figure 5 Welsh 'voiceless nasals' are a sequence of [Nh] as shown in the mutated form /və nhɐt/ [və nɦat] *fy nhad* 'my father' (right). The unmutated word /tʰɐt/ *tad* 'father' (left) is provided for comparison.

Traditionally, Welsh is described as also having phonemically contrastive voiceless nasals. However, both phonetically and phonologically, the 'voiceless nasals' are not true voiceless nasals (Hammond 2019). Rather, they are a sequence of the nasal in question followed by the glottal /h/ (Figure 5), and they are therefore transcribed as a sequence here. As with voiceless nasals in Angami (Ladefoged & Maddieson 1996: 111–116), Welsh voiceless nasals exhibit a period of aspiration toward the end of the segment. Unlike those of Angami, Welsh voiceless nasals are not truly voiceless; voicing is present during the nasal and may continue during the aspiration period due to coarticulation from the adjacent voiced nasal and vowel, resulting in [mɦ], [nɦ], [ŋɦ].

The labial, alveolar and velar voiceless nasal sequences /mh nh ŋh/ appear word-initially only as a result of nasal mutation of labial, alveolar and velar fortis plosives /pʰ tʰ kʰ/. Example (2) shows the voiceless nasals in a nasal mutation context, following the first-person possessive /və/ [və] ~ [ə] *fy* 'my', a trigger of nasal mutation.

(2)	/mh/	[və mɦen]	*fy mhen*	*pen*	my head
	/nh/	[və ˈnɦenis]	*fy nhenis*	*tenis*	my tennis*
	/ŋh/	[və ˈŋɦenɐɨ]	*fy nghenau*	*cenau*	my cub

Trills

Welsh has two alveolar trills, voiced /r/ *r* and voiceless /r̥/ *rh*. The voiced trill may appear in any position in the word, but the voiceless trill is confined to initial or pre-tonic syllables. In intervocalic position, the voiced trill may be realized as an alveolar tap [ɾ], as in /ˈɐrɐv/ [ʔɐɾɐv̥] *araf* 'slow'. In clusters, /r/ can also appear as alveolar approximant [ɹ] (G. E. Jones 1984: 49–50). Morris (2013) observed that /r/ was produced as the alveolar approximant [ɹ] by younger speakers of Northern Welsh, particularly in casual contexts.

The initial portion of the voiceless trill /r̥/ may be produced as a voiceless trill or fricative, while the latter portion is the glottal [h] (Figure 6, right). As has been observed for other languages (see Solé 2002), the Northern Welsh voiceless trill is acoustically similar to a fricative, with spectral energy in the 2–4 kHz range. The voiceless trill alternates with the voiced trill when preceded by a trigger of soft mutation (see 'Mutation' section). Figure 6 illustrates the difference between the voiced trill (left), which shows brief period of rapid tongue-tip opening and closure, and the voiceless trill (right), which shows only frication.

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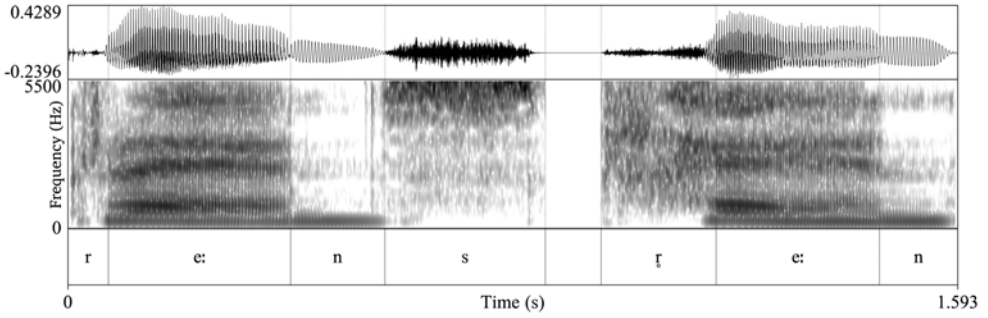

Figure 6 Initial voiced trill in /reːns/ [reːns] *rêns* 'reins' (left) in comparison with initial voiceless trill in /r̥eːn/ [r̥̊heːn] *rhên* 'ruler' (right).

Fricatives

The set of Welsh fricatives includes the paired voiceless and voiced labiodentals /f v/ and interdentals /θ ð/, as well as the voiceless alveolar /s/, lateral /ɬ/ (described in more detail below), velar /x/, and glottal /h/, which do not have voiced counterparts. Borrowings from English such as /ʃet/ *sied* 'shed' include the voiceless palatal fricative /ʃ/, a sound which otherwise appears in native vocabulary due to palatalization of the alveolar fricative /s/ in /si/ sequences.

All fricatives may appear word-initially and word-medially, and all but /h/ may appear word-finally. The voiceless fricatives /f θ x/ appear as the result of aspirate mutation of fortis plosives /pʰ tʰ kʰ/ (further discussed in the 'Mutation' section below). In speech, the labiodental voiced fricative /v/ is often deleted when it appears in word-final position but may be retained in the orthography: /tʰrev/ [tʰreːv] ~ [tʰreː] *tref* 'town'. The posterior voiceless fricative has been previously described as uvular /χ/ in Northern Welsh, and as velar /x/ in Southern Welsh (Ball & Williams 2001). However, velar /x/ best represents the fricative as produced by our consultant, and is therefore used here. /x/ is commonly followed by /w/ as in /xwɛx/ *chwech* 'six', and less commonly followed by a vowel: /xi/ *chi* 'you (PL)'.

In an acoustic study of fricatives in Northern Welsh, Jones & Nolan (2007) measured the duration, relative amplitude, and center of gravity of voiceless fricatives /f θ s ʃ ɬ/, and /χ/ (as noted above, we transcribe the voiceless dorsal fricative as velar /x/, rather than uvular /χ/). They found that the set of six voiceless fricatives could be divided into three pairs based on relative amplitude, with high amplitude /s/ and /ʃ/, medium amplitude /ɬ/ and /χ/, and low amplitude /f/ and /θ/.

Voiceless lateral fricative

The voiceless lateral fricative /ɬ/ *ll* may appear in any position in the word. As produced by our consultant, /ɬ/ shows a concentration of acoustic energy in the 4–6 kHz range. Jones & Nolan (2007) demonstrate that /ɬ/ is shorter in duration than other fricatives, and has a relatively high center of gravity, falling below the anterior fricatives /s f θ/ but above /ʃ/ and /x/. Figure 7 shows the differing concentration of spectral energy for fricatives /θ s ʃ/, and /ɬ/. Spectral energy for /ɬ/ is overall lower than for /s/ or /ʃ/, with no clear peak.

Lateral

Northern Welsh has a voiced lateral /l/, which may appear in any position in the word. /l/ also results from Soft Mutation of the voiceless lateral fricative /ɬ/. Northern Welsh /l/ is described as dark (velarized [lˠ]) in all positions (G. E. Jones 1984, Hannahs 2013), while Southern Welsh /l/ is light (non-velarized [l]) in onset and coda positions (G. E. Jones 1984,

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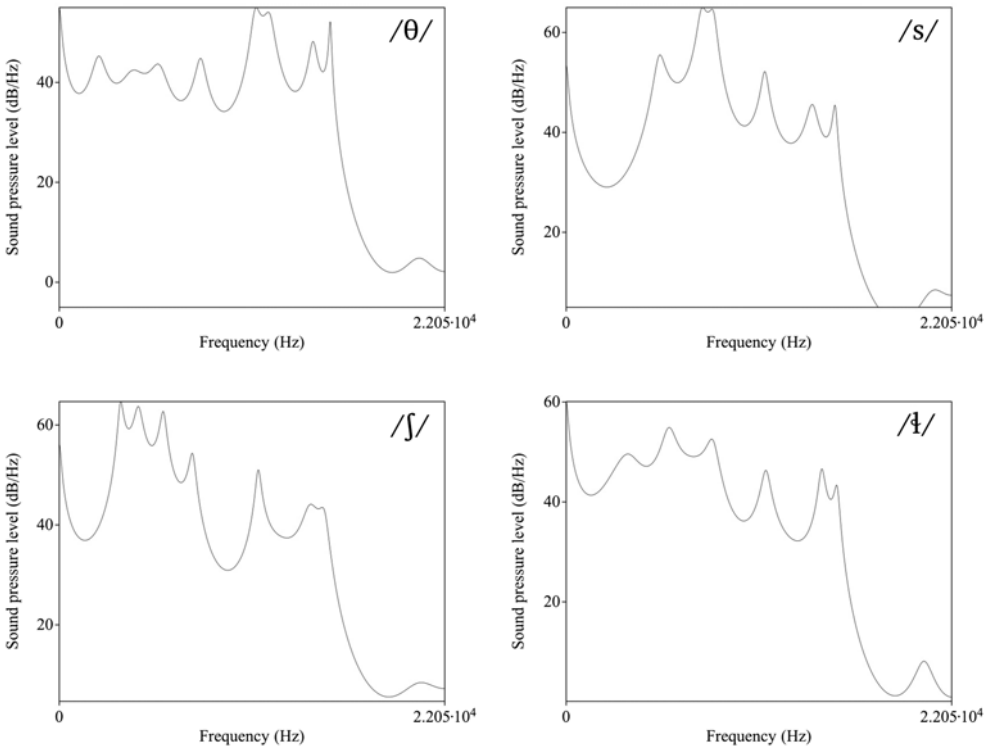

Figure 7 LPC spectra of Northern Welsh fricatives /θ/ (top left), /s/ (top right), /ʃ/ (bottom left), and /ɬ/ (bottom right) created using the Praat command 'To LPC (burg)' based on a 40 ms window around the midpoint of each fricative (extracted from Catrin's productions of fricative-initial items from the consonant minimal set) (Boersma & Weenink 2017).

Table 1 Measurements of F1 and F2 were taken at the midpoint of the lateral approximant in four words produced by our consultant Catrin. The smaller F2–F1 values in rows 3 and 4 indicate that Catrin produced a darker /l/ in coda position than in onset position.

Segment type	Word			Gloss	F1 (Hz)	F2 (Hz)	F2–F1 (Hz)
Onset	*lens*	/lɛns/	[lɛns]	lens	419.9	1112.4	692.5
	clust	/kʰlɨstʰ/	[kʰlɨstʰ]	ear	425.7	1404.6	978.8
Coda	*angel*	/ɐŋɛl/	[ˈʔɐŋɛl]	angel	682.2	1123.2	441.0
	aml	/ɐml/	[ˈʔɐmɐl]	often	738.2	1121.7	383.5

Ball & Williams 2001, Hannahs 2013). Previous research has used the difference between F2 and F1 to measure variation in /l/ darkness in Northern Welsh bilingual speech (Morris 2017) and in Scottish Gaelic (Nance 2014). Using this metric, we found that our consultant produced a darker /l/ in syllable coda position than in syllable onset position, indicated by a smaller F2–F1 value (see Table 1). Without more extensive data collection, we cannot speak as to whether this pattern is idiosyncratic to our speaker, or if differences in /l/ darkening according to syllable position are more common in Northern Welsh than previously reported.

When /l/ appears as the second element in a final cluster, it may be realized as syllabic [l̩] or an epenthetic copy of the vowel in the previous syllable may be inserted. Additional discussion of vowel epenthesis can be found in the section 'Vowel and consonant interactions' below.

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Approximants

Northern Welsh has two approximants, labiovelar /w/ and palatal /j/. The voiced labiovelar approximant /w/ appears word-initially primarily in words borrowed from English (/wɛlet/ *waled* 'wallet') or through the deletion of a word-initial /k/ as a result of Soft Mutation (/kwe/ *gwe* 'web' > /ə we/ *y we* 'the web'). It often appears word-medially and word-finally as an allophone of the high back round vowel /u/ in vowel–vowel sequences: /tɛrɬen-ɛtui/ [tɛrɬenˈɛtwi] *darllenadwy* 'legible'. The voiced palatal approximant /j/ appears as an allophone of pre-vocalic /i/ in both native vocabulary (/iexɨt/ [ˈjexɨt] *iechyd* 'health', /iɛiθ/ [jɛiθ] *iaith* 'language') and borrowed words (/iɛrt/ [jɛrt] *iard* 'yard'). /j/ also appears epenthetically between /i/ and /o/ in the common verb ending *-io*: /spio/ [ˈspijo] *sbio* 'to spy'.

Mutation

Welsh initial consonant mutation developed from a series of predictable and natural phonological effects such as intervocalic consonant lenition and nasal place assimilation. Over time, the conditioning environments were lost through regular historical sound change, resulting in a sometimes opaque system of mutation. See Hannahs (2013) for a discussion of mutation in Welsh phonology and King (2003) for a general overview of the grammar of Welsh mutation; Hannahs (2011) discusses mutation in the Celtic language family. There are three types of initial consonant mutation in modern Welsh, with the correspondences illustrated in (3) below. The 'Unmutated' column gives the phonetic (left) and orthographic (right) form of all consonants that are subject to mutation in Welsh. The subsequent columns show the results of the soft, nasal, and aspirate mutation processes on each mutateable consonant. The right side of each column provides the orthographic representation of each consonant (in italics); shading indicates that a particular consonant is not subject to that mutation process.

(3)

Unmutated		Soft Mutation		Nasal Mutation		Aspirate Mutation	
p^h	*p*	p	*b*	mh	*mh*	f	*ph*
t^h	*t*	t	*d*	nh	*nh*	θ	*th*
k^h	*c*	k	*g*	ŋh	*ngh*	x	*ch*
p	*b*	v	*f*	m	*m*		
t	*d*	ð	*dd*	n	*n*		
k	*g*	Ø	(null)	ŋ	*ng*		
m	*m*	v	*f*				
ɬ	*ll*	l	*l*				
r̥	*rh*	r	*r*				

Welsh mutation is indicated orthographically by the replacement of the affected consonant with its mutated counterpart. From the orthographic form, it can be unclear whether a form is mutated or not. For example, a word beginning with orthographic *n* may represent the mutated form of /d/, or it may correspond to an underlying /n/.

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Soft mutation

Soft mutation is the most common and robust mutation in Welsh, and causes voicing of voiceless obstruents and liquids, and fricativization of lenis plosives. The exceptions are /m/, which mutates to the voiced labiodental fricative /v/, and /k/, which deletes under soft mutation. Environments triggering soft mutation include the definite article when preceding a feminine noun, many common prepositions, certain prefixes, and the third-person masculine possessive pronoun, as (4) shows.

(4)

UNMUTATED FORM	MUTATED FORM	PHONOLOGICAL CHANGE
/merx/	/ə merx/ [ə verx]	/m/ → [v]
merch 'girl'	*y ferch* 'the girl'	
/pɐŋkor/	/i pɐŋkor/ [i ˈvɐŋkor]	/p/ → [v]
Bangor 'Bangor'	*i Fangor* 'to Bangor'	
/tʰrɐferθ/	/ti-tʰrɐferθ/ [tiˈtrɐferθ]	/tʰ/ → [t]
trafferth 'trouble'	*didrafferth* 'without problem'	
/kʰɐirtɨð/	/o kʰɐirtɨð/ [o ˈkɐirtɨːð]	/kʰ/ → [k]
Caerdydd 'Cardiff'	*o Gaerdydd* 'from Cardiff'	
/kɐrð/	/i kɐrð/ [i ɐrð]	/k/ → Ø
gardd 'garden'	*ei ardd* 'his garden'	

Nasal mutation

Nasal mutation developed from a historical process of regressive nasal assimilation. In the modern language, nasal mutation affects lenis plosives /p t k/ and fortis plosives /pʰ tʰ kʰ/, yielding /m n ŋ/ and /mh nh ŋh/, respectively. Lexical triggers of nasal mutation (the first-person singular possessive /və/ *fy* 'my' and the preposition /ən/ *yn* 'in') are inconsistently applied in the spoken modern language (King 2003), but nasal mutation is realized consistently when triggered word-internally, as by the negative prefix *an*-: /ɐn-tɐrɬen-ɐtui/ [ɐnɐrɬenɐtwi] *annarllenadwy* 'illegible', as seen in (5).

(5)

UNMUTATED FORM	MUTATED FORM	PHONOLOGICAL CHANGE
/pʰuɬheli/	/ən pʰuɬheli/ [əm mɦuɬˈheli]	/pʰ/ → [mɦ]
Pwllheli	y*m Mhwllheli* 'in Pwllheli'	

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/tʰɐt/	/və tʰɐt/ [və nfiɐt]	/tʰ/ → [nfi]
tad ‘father’	*fy nhad* ‘my father’	
/kʰəwir/	/ɐn-kʰəwir/ [ɐŋˈfiəwir]	/kʰ/ → [ŋfi]
cywir ‘correct’	*anghywir* ‘incorrect’	
/tɐrɬenɐtwi/	/ɐn-tɐrɬen-ɐtwi/ [ɐˌnɐrɬenˈɐtwi]	/t/ → [n]
darllenadwy ‘legible’	*annarllenadwy* ‘illegible’	

Aspirate mutation

Aspirate mutation causes fricativization of fortis plosives, resulting in voiceless fricatives. The bilabial plosive /pʰ/ alternates with the voiceless labiodental fricative /f/, the alveolar plosive /tʰ/ alternates with the voiceless dental fricative /θ/, and the velar /kʰ/ alternates with the voiceless velar fricative /x/. Like nasal mutation, aspirate mutation is highly variable in the modern language, and is most consistently realized following the third-person feminine possessive pronoun /ei/ [ei ∼ i] *ei* ‘her’. Among the triggers of aspirate mutation are /kɨtɐ/ *gyda* ‘with’, and numerals /tri/ *tri* ‘three’ and /xwɛx/ *chwech* ‘six’. Another aspiration process occurs when, following the possessive pronouns /ei/ *ei* ‘her’, /eɨ/ *eu* ‘their’ or /ein/ *ein* ‘our’, /h/ is inserted at the beginning of a vowel-initial word (Borsley, Tallerman & Willis 2007: 19).[4] Examples of aspirate mutation are given in (6).

(6)

UNMUTATED FORM	MUTATED FORM	PHONOLOGICAL CHANGE
/pʰopl/	/kɨtɐ pʰopl/ [ˈkɨtɐ ˈfopol]	/pʰ/ → [f]
pobl ‘people’	*gyda phobl* ‘with people’[5]	
/tʰɐːn/	/tʰri tʰɐːn/ [tʰri θɐːn]	/tʰ/ → [θ]
tân ‘fire’	*tri thân* ‘three fires’	
/kʰi/	/ei kʰi/ [i xi]	/kʰ/ →[x]
ci ‘dog’	*ei chi* ‘her dog’	

Note that mutation is the only indicator of gender for the third-person possessive pronoun /i/ *ei* ‘his, her’, where ‘his’ triggers soft mutation and ‘her’ triggers aspirate mutation on the following possessed noun: /i ki/ *ei gi* ‘his dog’[6] vs. /i xi/ *ei chi* ‘her dog’. For possessed nouns

[4] This process of /h/-insertion is inconsistent in the spoken language (King 2003: 81) and no example recordings were collected.

[5] It should be noted that /kɨtɐ/ *gyda* ‘with’ is not in common use in Northern Welsh but was familiar to our consultant as a trigger of Aspirate Mutation.

[6] No recording of /i ki/ *ei gi* ‘his dog’ was collected.

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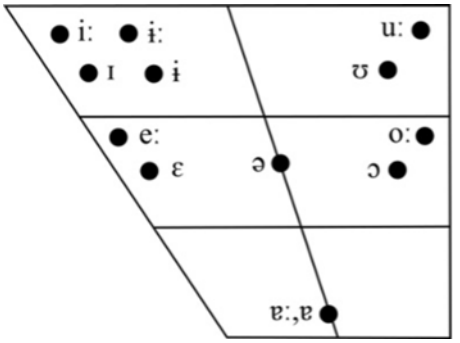
beginning with consonants that are unaffected by mutation, possessor gender is apparent only when indicated by context or a following optional pronoun /o/ *o* 'he' or /hi/ *hi* 'she'.

Vowels



/ɐː/[7]	mɐːn	*mân*	small
/ɐ/	mɐn	*man*	place
/eː/	ɬeːn	*llên*	literature
/ɛ/	ɬɛn	*llen*	curtain
/iː/	tʰiːn	*tîn*	bottom
/ɪ/	tʰɪn	*tin*	tin
/ɨː/	kʰɨːn	*cŷn*	chisel
/ɨ/	kʰɨn	*cyn*	before
/oː/	tʰoːn	*tôn*	tune
/ɔ/	tʰɔn	*ton*	wave
/uː/	kʰuːn	*cŵn*	dogs
/ʊ/	kʰʊn	*cwn*	(nonce)
/ə/	ˈmənɨð	*mynydd*	mountain

Previous descriptions of the vowels of Northern Welsh include G. E. Jones (1984), Ball & Williams (2001: Chapter 3), Mayr & Davies (2011), Mayr et al. (2017) and Bell (2018); Ball (1976) includes a thorough overview of early documentation work on Northern Welsh vowels. General descriptions of the vowels of Welsh dialects are found in Ball & Williams (2001) and Hannahs (2013). Iosad (2017) also addresses the Welsh vowel system, specifically in a dialect of South-Western Welsh, but makes observations that are relevant to Northern Welsh as well.

[7] Although much previous work transcribes the low vowel(s) of Welsh with /a/, we use /ɐ/ to better capture the central realization of the vowel in our consultant's speech.

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Northern Welsh contrasts thirteen monophthongs in stressed syllables. Twelve of these (excluding /ə/), can be organized into pairs differing in length and vowel quality /ɐː ɐ, eː ɛ, iː ɪ, iː ɨ, uː ʊ, oː ɔ/. The high central vowels /iː ɨ/ are a feature of Northern Welsh not shared with southern dialects of the language, where these vowels have merged with the high front vowels /iː i/ (Hannahs 2013). While long vowels are traditionally described as monophthongal (Mayr & Davies 2011), Catrin produced long vowels /iː ɨː uː/ with strong offglides, as in /tʰiːn/ [tʰiːjən] *tîn* 'bottom', /kʰɨːn/ [kʰɨːjən] *cŷn* 'chisel', /kʰuːn/ [kʰuːwən] *cŵn* 'dogs'.

The distribution of long and short vowels is restricted by syllable position, stress, and following consonant(s). In unstressed syllables and non-final syllables, all vowels are short (B. Williams 1983). While in southern dialects of Welsh, long vowels may appear in both penultimate and ultimate stressed syllables, in Northern Welsh, long vowels are restricted to stressed word-final syllables, a category that includes monosyllables (Awbery 1984, Hannahs 2013, Iosad 2017). The distribution of long vowels is further restricted by the following consonant; long vowels appear in open syllables, before unaspirated plosives /p t k/, fricatives /f v θ ð x/, and fricative-plosive clusters /ft sp st sk ɬt/. Short vowels appear before aspirated plosives /pʰ tʰ kʰ/, fricatives /s ɬ/, nasals /m ŋ/, and all other clusters (see 'Syllables' section for a description of all possible coda clusters). A minimal set of monosyllables demonstrating vowel quality and centralization differences before /t/ and /tʰ/ is given in (7). Vowel length is lexically contrastive only in monosyllables with coda /n l r/.

(7)

	LONG VOWEL (BEFORE AN UNASPIRATED PLOSIVE)			SHORT VOWEL (BEFORE AN ASPIRATED PLOSIVE)		
/ɐː ɐ/	[pɐːt]	*bad*	boat	[pɐtʰ]	*bat*	cricket bat
/eː ɛ/	[peːt]	*bed*	(nonce)	[pɛtʰ]	*bet*	hatred
/iː ɪ/	[piːt]	*bid*	let him be	[pɪtʰ]	*bit*	drill bit
/oː ɔ/	[poːt]	*bod*	to be	[pʰɔtʰ]	*pot*	pot
/uː ʊ/	[puːt]	*bwd*	(nonce)	[pʊtʰ]	*bwt*	butt, barrel
/ɨː ɨ/	[pɨːt]	*byd*	world	[pʰɨtʰ]	*put*	pit
/ə/	[ˈpətɨ]	*bydy*	(nonce)	[ˈpʰətʰɨ]	*pyty*	(nonce)

Figures 8 and 9 show F1 and F2 (Hz) values for Northern Welsh monophthongs produced by the supplementary five female speakers of Northern Welsh described above. Catrin did not contribute to this portion of the data. Items were recorded using a word-reading task within a carrier phrase, and each item was produced three times. Items included the target vowels in three environments: before the lenis alveolar plosive /t/ and before the fortis alveolar plosive /tʰ/ (Figure 8), and before the alveolar nasal /n/ (Figure 9).[8] An exception to the short vowel centralization pattern is /ɐː ɐ/, which does not appear to participate in spectral quality contrasts, likely due to the constrained nature of the lower vowel space.

Figure 10 shows the duration of monophthongs produced in different following consonant environments. On the left, allophonic vowel duration varies widely due to the coda consonant. On the right, phonemically long vowels have greater duration than short vowels, with the exception of the /eː ɛ/ pair, which overlap in duration. Looking in more detail at the duration distribution of the /eː ɛ/ vowel pair, Figure 11 shows that phonemically long and

[8] See Bell (2018) for an in-depth investigation and discussion of allophonic and phonemic differences in vowel length and quality in Northern Welsh.

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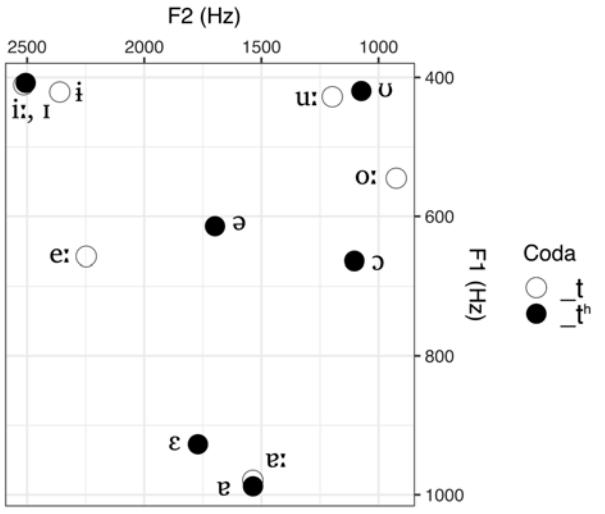

Figure 8 Plot of mean F1 and F2 (Hz) values of monophthongal Welsh vowels in stressed syllables before /tʰ/ and /t/. In error, no tokens of /i/ before fortis /tʰ/ were collected so only tokens of /i/ before lenis /t/ are included in the plot (5 speakers × 12 vowels × 3 repetitions = 180 tokens used to produce the plot).

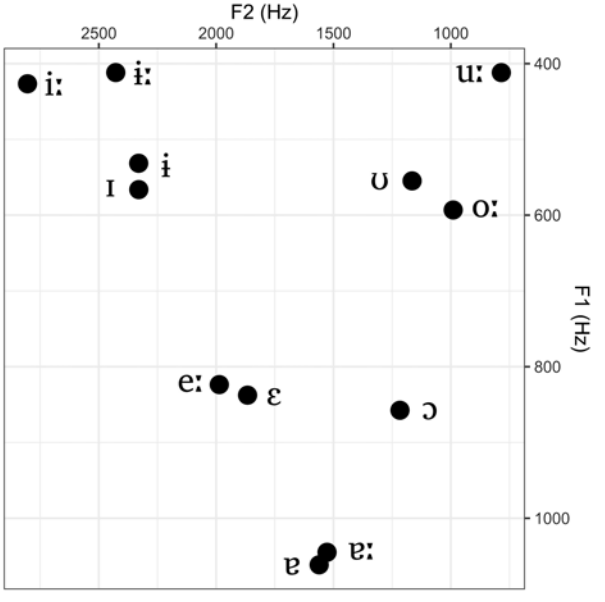

Figure 9 Plot of mean F1 and F2 (Hz) values of monophthongal Welsh vowels in stressed syllables before /n/ (5 speakers × 12 vowels × 3 repetitions = 180 tokens used to produce the plot).

short members of the /eː ɛ/ pair contrast in duration for some speakers (2, 3), but not for others (1, 4, 5).

The contrast between the high front and high central vowels of Northern Welsh is a traditional shibboleth of the dialect, distinguishing it from southern dialects where these vowel categories have merged (Ball 1981, G. E. Jones 1984, Hannahs 2013). Recent work by Mayr

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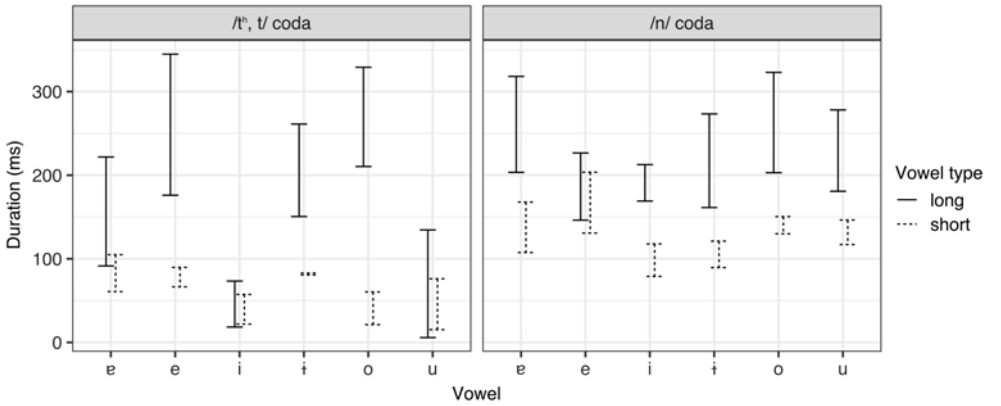

Figure 10 Duration differences in Welsh monophthongs due to following consonant (left) and phonemic length contrast (right). Lines extend one standard deviation above and below the mean value measured for the duration of each vowel. Dotted lines indicate short vowel values, and solid lines indicate long vowel values (5 speakers × 12 vowels × 4 contexts × 3 repetitions = 720 tokens used to produce the plot).

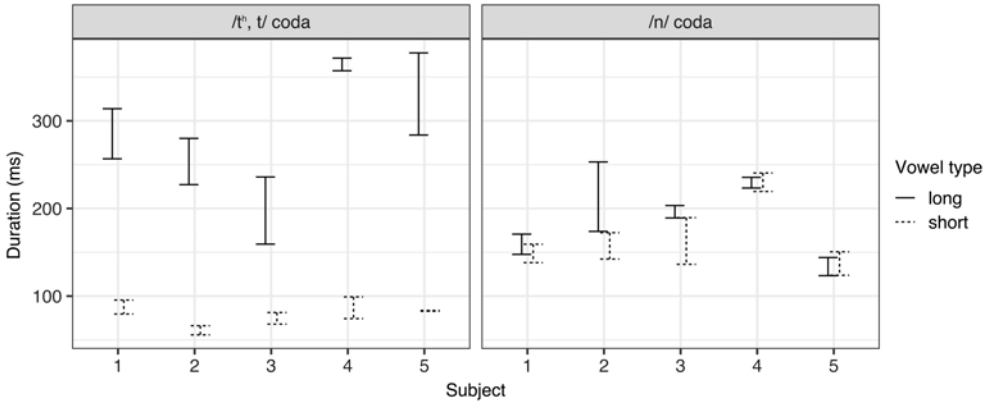

Figure 11 Duration differences in the vowel pair /eː ɛ/ due to following consonant (left) and phonemic length contrast (right) by speaker, showing inter-speaker variation in the use of duration as a cue to vowel length. Dotted lines indicate short vowel values, and solid lines indicate long vowel values (5 speakers × 2 vowels × 4 contexts × 3 repetitions = 120 tokens used to produce the plot).

& Davies (2011) supports this dialect difference, but the acoustic data presented here is more complex, as Figure 12 shows. We refer readers interested in the geographic distribution of the Welsh high front and high central vowel contrast to the Welsh dialect survey (A. R. Thomas 2000) and to recent work by Rees (2016) that investigated these vowels in dialects of central Wales.

The mid central unrounded /ə/ does not exhibit length alternations. /ə/ appears in any syllable of a polysyllabic word when a subsequent syllable contains the nucleus /ɨ/ *y*: /ənɨs/ [ˈən.is] *ynys* 'island', /mənɨð/ [ˈmə.nɨð] *mynydd* 'mountain' (Figure 13). /ə/ also appears in unstressed monosyllabic function words such as /tə/ *dy* 'your' and /ən/ *yn* 'in'.

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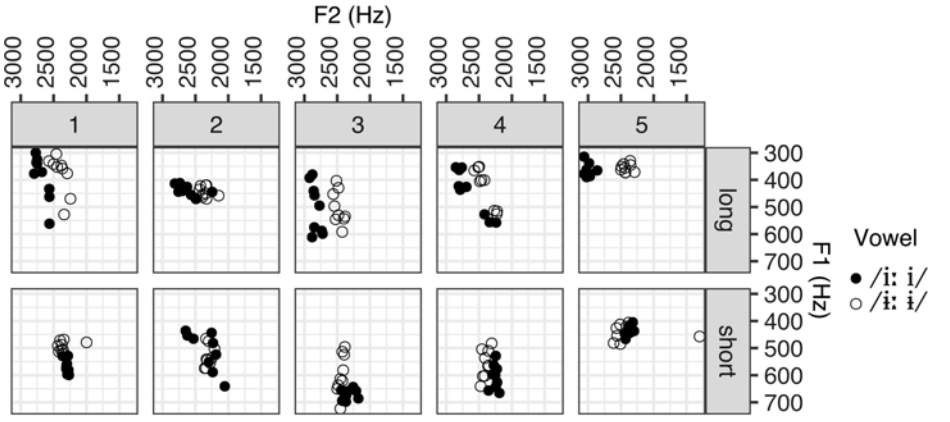

Figure 12 F1 and F2 (Hz) values for vowels /**iː ɨ**/ and /**ɨː ɨ**/, demonstrating overlap between the categories /**iː**/ and /**ɨː**/ for some speakers (Speaker 2), but not for others (Speaker 5). Short vowels /**ɨ**/ and /**ɨ**/ show overlap for all speakers. Plots were produced with data collected from five female native speakers of Northern Welsh (5 speakers × 4 vowels × 3 repetitions = 60 tokens used to produce the plot).

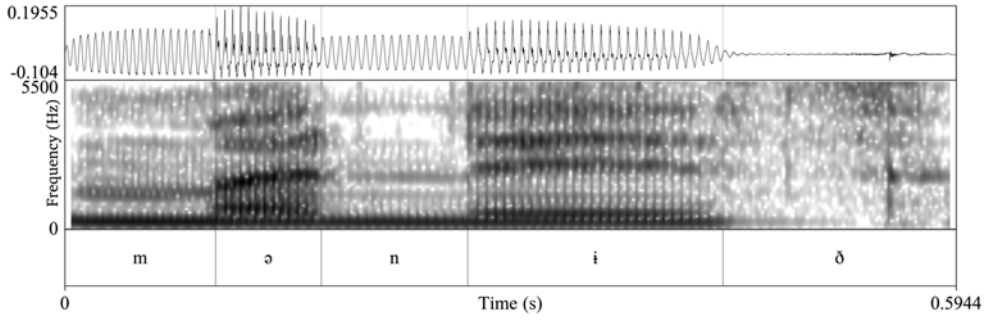

Figure 13 Spectrogram of /ˈmə.nɨð/ *mynydd* 'mountain' illustrating the quality difference between the stressed /**ə**/ and unstressed /**ɨ**/, both spelled *y*.

Diphthongs

/ɐɪ/	[r̥ɐɪt]	*rhaid*	necessity
/ɔɪ/	[ˈpɔɪ.kʰɔtʰ]	*boicot*	boycott
/əɪ/	[ˈpəɪ.pɪl]	*beibl*	bible
/ɐʊ/	[pɐʊt]	*bawd*	thumb
/ɛʊ/	[mɛʊn]	*mewn*	in
/əʊ/	[pəʊɪt]	*bywyd*[9]	life
/ɪʊ/	[pɪʊˈmɐ.rɛs]	*Biwmares*	Beaumaris

[9] The recorded token of /pəʊɪt/ *bywyd* 'life' provided was produced by Catrin in a sentential context on a separate occasion but was (to our knowledge) recorded using the same equipment described above.

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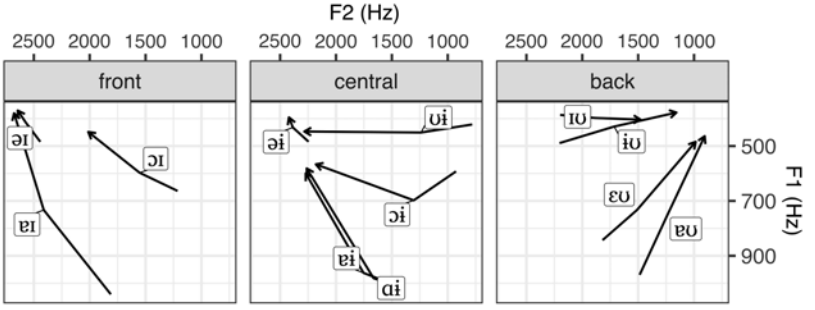
/ɨʊ/	[pɨʊ]	*byw*	to live
/ɐɨ/	[pʰɐɨn]	*paun*	peacock
/ɑɨ/	[ˈpɐɨ.ðɨ]	*baeddu*	to make dirty
/ɔɨ/	[pʰɔɨn]	*poen*	pain
/ʊɨ/	[pʊɨt]	*bwyd*	food
/əɨ/	[ˈpəɨ.tɨ]	*beudy*	cowshed

Northern Welsh is described as having thirteen diphthongs, which can be divided into three categories: front-closing, central-closing, and back-closing (Hannahs 2013). One category, transcribed by Hannahs as /ɑɨ/, was not distinct from the diphthong /ɐɨ/ in the speech of our consultant, as reflected in the phonetic transcriptions in the above list. Figure 14 shows the F1 and F2 (Hz) values for diphthongs recorded by the same group of five speakers as the monophthong items discussed above, divided into three groups based on the location of the diphthong's closing element.



Note: No tokens of the back-closing diphthong [əʊ] were collected from the additional speakers, so it is not included in Figure 14.

Figure 14 Each diphthong is represented by line segments connecting the mean F1 and F2 (Hz) values taken at 25%, 50%, and 75% of the vowel's duration, measured from productions of real words by five female speakers of Northern Welsh (5 speakers × 12 diphthongs × 3 repetitions = 180 tokens used to produce the plot).

Vowel and consonant interactions

Vowels and consonants interact in Welsh in several ways. Vowel-initial words are consistently realized with a preceding glottal stop: /ɐmen/ [ˈʔɐːmɛn] *amen* 'amen'. In monosyllables, word-final nasal and liquid consonants are realized with shorter duration following a long vowel than when following a short vowel (Figure 15).

Consonants lengthen following a stressed short vowel and preceding an unstressed vowel (Figure 16). Unsuffixed forms contrast with their stress-shifted suffixed counterparts: /hɐpʰɨs/ [ˈhɐp.pʰɨs] *hapus* 'happy' > /hɐpʰɨs-ɐx/ [hɐ.ˈpʰɨsɐx] *hapusach* 'happier', and /ɐtʰep/ [ˈʔɐt.tʰep] *ateb* 'answer' > /ɐtʰep-ion/ [ʔɐ.ˈtʰep.pion] *atebion* 'answers' (Fynes-Clinton 1913, Hannahs 2013). Hannahs (2013) describes these geminate consonants as ambisyllabic. Table 2 shows the duration of geminated and ungeminated stops produced by our consultant (averaged across three tokens of each item).

In rising sonority clusters following a stressed syllable, a copy of the preceding vowel may be epenthesized between members of the cluster. This epenthetic process is more common in casual speech, and applies to clusters with /n/, /l/ or /r/ as the second element. Other examples

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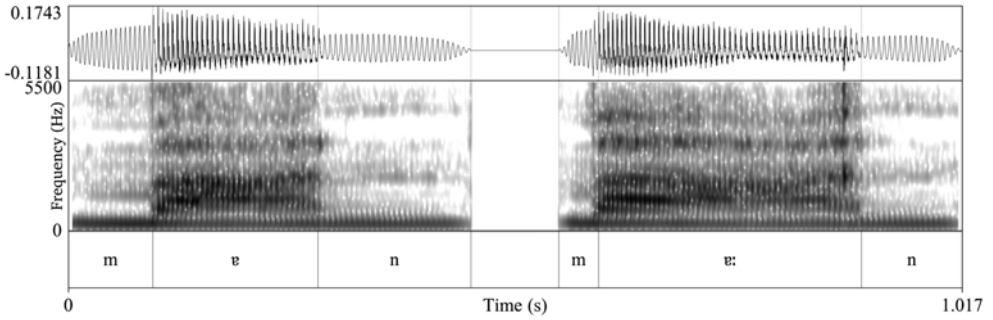

Figure 15 Coda duration varies according to duration of the preceding vowel, as shown in the minimal pair /mɐn/ *man* 'place' vs. /mɐːn/ *mân* 'small'.

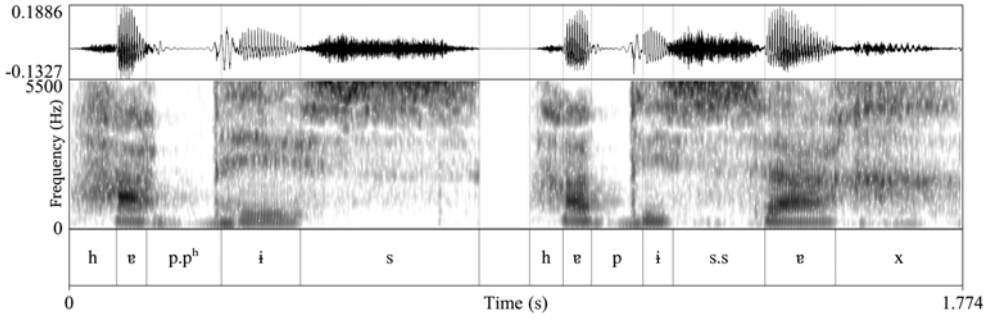

Figure 16 Fortis stops /pʰ tʰ kʰ/ geminate when followed by an unstressed vowel. Compare geminate /pʰ/ in /ˈhɐp.pʰɨs/ *hapus* 'happy' (left) to singleton in /hɐ.ˈpʰɨs.sɐx/ *hapusach* 'happier' (right).

Table 2 Durations of geminated and ungeminated plosives, averaged across three tokens of each item.

Word		Gloss	Consonant	Duration (ms)
hapus	[ˈhɐp.pʰɨs]	happy	/pʰ/	200
hapusach	[hɐ.ˈpʰɨsɐx]	happier	/pʰ/	124
ateb	[ˈɐt.tʰep]	answer	/tʰ/	209
atebion	[ɐ.ˈtʰep.pion]	answers	/tʰ/	134

include /peipl/ [ˈpeipl̩ ~ ˈpeipil] *beibl* 'bible', /ɐml/ [ˈʔɐml̩ ~ ˈʔɐmɐl] *aml* 'often' and /tuvn/ [ˈtuvn̩ ~ ˈtuvun] *dwfn* 'deep' (Awbery 1984, Hannahs 2013).

Prosody

Syllables

Syllables in Northern Welsh may have up to three consonants in the onset (Ball & Williams 2001, Mayr, Jones & Mennen 2014). In unmutated words, two-consonant onset clusters may consist of either an obstruent + liquid (/tʰrev/ *tref* 'town') or two obstruents (/stopʰjo/ *stopio* 'to stop'). Sonorant + liquid clusters occur as the result of nasal mutation of a lenis plosive + sonorant cluster (for example, /pr/ mutates to /mr/). Three-consonant onset clusters may consist of an /s/ + stop + liquid sequence (/strɨt/ *stryd* 'street') or a /k/ + /w/ + liquid

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Table 3 Average values for penultimate and ultimate vowel (V) and coda (C) duration (dur.) were calculated across three tokens of each item (all produced by our consultant Catrin).

		Penultimate (stressed)			Ultimate (unstressed)		
Word	Gloss	V dur. (ms)	Following C dur. (ms)	f0 (Hz)	V dur. (ms)	Following C dur. (ms)	f0 (Hz)
ysgrif [ˈəs.kriv]	article, essay	64	233	200	119	169	188
ysgrifen [əs.ˈkri.ven]	writing	87	100	223	107	145	189
ysgrifennydd [ˌəs.kri.ˈven.nɨð]	secretary	92	87	204	167	167	173
ysgrifenyddes [əs.ˌkri.ve.ˈnə.ðes]	female secretary	85	88	204	117	346	178
ysgrifenyddesau [ˌəs.kri.ˌve.nə.ˈðe.sɐɨ]	female secretaries	42	238	208	122	–	183

sequence (/kwrɐnto/ *gwrando* ‘to listen’, /kwneɨt/ *gwneud* ‘to do’, /kwlɐt/ *gwlad* ‘nation’) (examples from Mayr et al. 2014). These k/ + /w/ + sonorant clusters are often realized with a labialized or rounded /k/ [k^{w}].

Syllable codas in Northern Welsh may include up to three consonants. Three-consonant codas are of the type /s/ + /t/ + liquid (/meistr/ *meistr* ‘master’). Two-consonant coda clusters may be of the type obstruent + obstruent (/klɨst^{h}/ *clust* ‘ear’) or sonorant + obstruent (/kɐrð/ *gardd* ‘garden’). Final obstruent + sonorant sequences (as in /tiskɨpl/ *disgybl* ‘pupil, student’) are often subject to vowel epenthesis as discussed above in the section ‘Vowel and consonant interactions’. Geminate consonants (such as those shown in Figure 16) are broken across syllable boundaries (Ball & Williams 2001, Hannahs 2013).

Stress

Stress in native Welsh typically falls on the penultimate syllable of polysyllabic words. The majority of exceptions have final stress, including polymorphemic words beginning with /əm/ *ym*-REFLEXIVE. Compare monomorphemic /ˈəm.lɐːð/ *ymladd* ‘to kill’ and polymorphemic /əm.ˈlɐːð/ *ymlâdd* ‘to tire oneself’. Words with antepenultimate stress are also found in Welsh, but are usually borrowings from English. When suffixes are applied to a penultimate stress polysyllabic stem, primary stress is maintained on the penultimate syllable, regardless of morpheme boundaries. In words with four or more syllables, secondary stress, described by Ball & Williams (2001: Chapter 12) as a ‘rhythmic prominence’, appears on all even numbered syllables to the left of the penultimate primary stress.

For a detailed explanation of the phonetic correlates of stress in Welsh, see B. Williams (1999). In brief, stressed syllables are shorter in duration and have lower amplitude than their following (unstressed) ultimate syllables. Consonants following stressed vowels are longer in duration than consonants following unstressed vowels (B. Williams 1999, Webb 2011). Table 3 demonstrates variation in syllable stress and pitch due to repeated suffixation to the root word /əskriv/ [ˈʔəs.kriv] *ysgrif* ‘article, essay’. Previous accounts of Welsh stress have described stressed syllables as having lower f0 (B. Williams 1983, Mennen, Mayr & Morris 2015). In our consultant’s speech this pattern was not observed; Catrin produced consistently higher pitch in stressed penultimate syllables than in unstressed ultimate syllables, as Table 3 shows.

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Intonation

Due to the limitations of our data set, an analysis of intonation was not possible, however, Cooper (2015) provides an in-depth analysis of phonetic implementation of intonation in Anglesey Welsh, a dialect of Northern Welsh similar to the variety described here. As in many languages, intonation is used in Northern Welsh to distinguish interrogative and declarative utterances; the height of the nuclear pitch peak (defined as the strongest stress in the phrase) in interrogatives varies according to the amount of lexical and syntactic marking present in the question, and is consistently higher in questions than in statements (Cooper 2015). Cooper also describes a L+H∗ pitch accent consisting of a low tone (aligned with the onset of the stressed syllable's initial consonant) followed by a high tone (aligned within the stressed syllable's nucleus) that occurs on both the pre-nuclear and nuclear stressed syllables of a phrase. Additional descriptions of Welsh intonation in general can also be found in Thomas (1967), Pilch (1975), Rhys (1984), and Evans (1997).

Transcription of recorded passage

Broad phonemic transcription

ɹɔið kwɪntʰ ə kɔklɛð ɐr hɐil ən tɐtlɐ | pʰɐ ɨn ohonɐintʰ ɔið krəvɐv | pʰɐn tɐiθ tʰəɪθɪuɾ həɪpio wɛti ei lɐpio mɛʊn kʰlɔkɪn kʰənɛs ‖ kʰətʰinɐsɐntʰ mɐɪr ɨn ə luwɨðɐɪ | iu nəɨt ə tʰəɪθɪuɾ təni e klɔkɪn kəntʰɐ | vəðɐɪr ɨn kʰrəvɐv ‖ ənɐ ve xwəθɔð kwɪntʰ ə kɔklɛð kʰɨn kɐletʰɛt ɐk ə kɐɬɐɪ | ɔnt pʰo vuɨɐːv ə xwəθɐɪ | ə mʊɨɐv tʰɪn ə tʰənɐɨr tʰəɪθɪuɾ ei klɔkɪn ɐmtɐno ‖ ɐkʰ ən ə tiwɛð | pʰəɪtiɔð kwɪntʰ ə kɔklɛð ɐr ei əmtrɛx ‖ ənɐ skləɪniɔð ər hɐil ən tɐnpɐɪt | ɐkʰ ən sɨθ pɨn tʰənɔð ə tʰəɪθɪuɾ ei klɔkɪn ‖ ɐkʰ veɬi ɹoið ən ɻɐit i wɪntʰ ə kɔklɛð kətnɐpɔt | mɐɪr hɐil ɔið ə kʰrəvɐv ohonɐintʰ

Narrow phonetic transcription

roið gwɪntʰ ə gɔklɛð ɐr hɐil ən dɐtlɐ | pʰɐʲ ɨn ohonɐintʰ ɔɪθ gɾəvɐv | pʰɐn dɐɪθ tʰeiθijɔr heipijɔ wɛti ei lɐpʰjɔ mɔ̃ klɔkɪn kʰənɛs ‖ kʰətʰinɐsɛ̃ntsʰ mɐɪr ɨn ə lwiðɐi | iju neit ɪr tʰeiθjɔr dəni jeɪ glɔgɪn gn̥tsʰɐ | vəðɐr ɨn kʰrəvɐ ‖ ənɐ vɛ xʷəθɔð gwɪntʰ ə gɔʰklɛð kʰɨn gɐlɛtʰɛð ɐgə gɐɬɐɨ | ɔ̃n pʰɔ vuijɐ xʷəθɐɨ | ə mʷijɐv tʰɨn tʰənɐiɾ tʰeiθiɔr ei glɔkɪn ɐmdɐnɔ ‖ ɐkʰ ən ə diwɛð | pʰeitiɔð gwɪntʰ ə gɔklɛð ɐr i əmdɾɛx ‖ ənɐ skleĩniɔð ər ɦɐil ə̃n dɐmpɐit | akʰ ən sɨθ pɪn tʰənɔð ə tʰeiθijɔr ei glɔgɪn ‖ akʰ vəɬi ɾɔð ə ɾhɐit i wɪntʰ ə gɔklɛθ gətnɐpɔt | mɐiɾ hɐil ɔjð ə krəvɐv ohonɪntsʰ

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Orthographic version

Roedd Gwynt y Gogledd a'r Haul yn dadlau pa un ohonynt oedd gryfaf, pan ddaeth teithiwr heibio wedi ei lapio mewn clogyn cynnes. Cytunasant mai'r un a lwyddai i wneud i'r teithiwr dynnu ei glogyn gyntaf fyddai'r un cryfaf. Yna fe chwythodd Gwynt y Gogledd cyn galeted ag y gallai, ond po fwyaf y chwythai, y mwyaf tynn y tynnai'r teithiwr ei glogyn amdano, ac yn y diwedd peidiodd Gwynt y Gogledd ar ei ymdrech. Yna sgleiniodd yr Haul yn danbaid, ac yn syth bin tynnodd y teithiwr ei glogyn. Ac felly roedd yn rhaid i Wynt y Gogledd gydnabod mai'r Haul oedd y cryfaf ohonynt.

English translation

The North Wind and the Sun were arguing which of them was the strongest, when a traveler came past wrapped in a warm cloak. They agreed that the one who succeeded in making the traveler take off his cloak first would be the strongest. Then, the North Wind blew as hard as he could, but the more he blew, the more tightly the traveler pulled his cloak about him, and in the end, the North Wind had to cease his effort. Then the Sun shone brightly, and straight away, the traveler took off his cloak. And so, the North Wind had to agree that the Sun was the stronger of them.

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Supplementary material

To view supplementary material for this article (including audio files to accompany the language examples), please visit https://doi.org/10.1017/S0025100321000165.

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