

LENGTH AND SYLLABIFICATION IN ICELANDIC

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ABSTRACT

The domain of length in Modern Icelandic is the syllable Rhyme. Length in stressed syllables is realized by either a branching Nucleus or a branching Coda. The consonant at the end of a word is extrametrical. Arguments are presented against an analysis in which the domain of length is the syllable Nucleus. The analysis takes into account the lengthening of preconsonantal consonants in stressed syllables observed by traditional scholars. The resulting analysis predicts length by a single lengthening rule, and avoids syllable restructuring and vowel shortening rules.

INTRODUCTION

Modern Icelandic exemplifies the close relation between stress and quantity that has been observed in many languages. In Modern Icelandic, length of syllables is predictable from stress: stressed syllables are long, and unstressed syllables are short. Icelandic thus contrasts with English, in which stress is at least partly predictable from syllable length. Quantity in Icelandic has been approached from both a prosodic and a segmental point of view. For Haugen [11], quantity belongs to syllables; in particular to the Nucleus, which Haugen claims is complex in long syllables. Anderson [1] and Árnason [3] refine Haugen's proposal by saying that the Nucleus is branching in long syllables and non-branching in short syllables. Benediktsson [4] adopts a segmental approach to length, arguing that quantity can be represented at a phonemic level by the contrast between long and short consonants, with vowel length predicted by allophonic rules. I will argue for the prosodic approach to Icelandic quantity, using an autosegmental framework. I will claim that length is inherent in the syllable Rhyme rather than in the Nucleus alone.

In Icelandic, primary word stress falls on the initial syllable of a word, and secondary stresses occur in alternating patterns, with morphologically determined variations [2]. Syllables are long under both primary and secondary stress, although some shortening occurs under secondary stress [6]. In stressed syllables, long vowels and long consonants are in complementary distribution, as in (1).

- (1) a. VC: menn 'men' (nom. pl.) [men:]
 b. V:C men 'necklace' [mɛ:n]
 c. V: bú 'household' [bu:]

A syllable with a V or VC Rhyme is not long, and a V:C Rhyme is not permitted. Icelandic is thus unlike English, in which a VC syllable may be long,

and unlike Estonian, in which a long syllable may be V:C: [14].

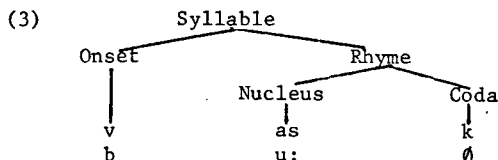
Ófeigsson [16] and Einarsson [5,6] have noted in addition that preconsonantal consonants are lengthened under stress, as in *hestur* 'horse' and *iðja* 'industry,' which Einarsson [6] transcribes as [hes·tʏr̥] and [ið·ja]. This consonant lengthening is most apparent under contrastive stress [3] and in words used as citation forms. Ófeigsson and Einarsson transcribe the lengthened consonants as half-long, assuming a degree of length between long and short. Liberman [15] did not find any significant difference in duration between the *s* in *last* 'blame' and the *s* in *gulast* 'most yellow,' which should be short since it is in an unstressed syllable. But Liberman notes that the phonetic correlates of quantity are as yet ill-determined and may involve intensity as well as duration. Liberman concludes that consonants such as the *n* in *mynd* 'picture' and the *s* in *last* carry the "quantitative peak" and leaves the phonetic realization indeterminate. In this paper, I shall adopt Haugen's proposal [11] that preconsonantal consonants have full length phonologically under stress. I shall not address the question of their phonetic value, but I shall assume with Haugen that they may be reduced by reduction processes operating in consonant clusters. Lengthening applies to continuants, sonorants, and voiced stops, as in (2).

- (2) a. hafði [hav·ði] 'had'
 b. lax [lax·s] 'salmon'
 c. sagði [səy·ði] 'said'
 d. sandur [san·dʏr̥] 'sand'
 e. harður [har·ðʏr̥] 'hard'
 f. sigla [siɣ·la] 'to sail'

Voiceless stops are preaspirated in this position [19], a topic I cannot explore here.

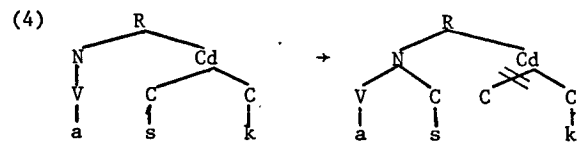
SYLLABIC ANALYSES

Árnason [3] proposes a syllabic account of quantity in Icelandic which incorporates lengthening of preconsonantal consonants under stress. He assumes with Haugen [11] that quantity is localized in the Nucleus and that the lengthened consonant is part of the Nucleus. Árnason represents *vask* [vas·k] 'sink' (acc.sg.) and *bú* as in (3).

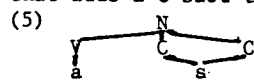


Arnason speaks of elements in the Nucleus as being "stretchable." In more formal terms, we can say that the second element in the Nucleus is lengthened, giving a long *s*.

Anderson [1] gives a more formalized syllabic analysis. He too assumes that length is localized in the Nucleus. However, he does not consider the consonant lengthening. He defines stressed syllables as those that have branching nuclei, which need not be binary branching in underlying form, but are reduced to binary branching on the surface. A stressed syllable with a short vowel fills in the Nucleus by moving the consonant in the Coda into the Nucleus, as in (4), which represents the Rhyme of *vask*. Here, the association of the consonant to the Coda is broken and the consonant is reassigned to the Nucleus. *Cd* stands for Coda.



We can formalize the lengthening of the *s* by a rule that adds a C slot to the Nucleus, as in (5).



Ternary nuclei must be limited to this structure, since Icelandic does not have overlong vowels or overlong syllabic consonants. The need for a lengthening rule shows that Anderson's movement rule is not sufficient to account for the data. By giving up the movement rule and lengthening the consonant in its base generated position in the Coda, we will achieve the same empirical result and at the same time simplify the grammar. A grammar without the movement rule must also give up the requirement that long syllables have branching nuclei, since the Nucleus in *vask* will be non-branching.

Another problematic aspect of length is the difference between monosyllables and polysyllables. In monosyllables, a vowel or diphthong is long if it ends the word, as in *skó* [skou:] 'shoe' and *bú* [bu:], or if it is followed by just one consonant, as in *skip* [skj:ph] 'ship' and *hár* [hau:r] 'hair.' (It is debatable which part of the diphthong is lengthened, Haugen [11] claiming it to be the off-glide. I will not pursue the matter here.) In monosyllables ending in two consonants, the consonant immediately following the vowel is lengthened, as in *skips* [skj:fs] 'ship' (gen.sg.) and *báls* [bau:ls] 'fire' (gen.sg.). In disyllables, the stressed vowel is lengthened if it ends the syllable, as in *höðfuð* [hö:vYó] 'head.' The § here is not part of the spelling but marks the syllable division. If the syllable ends in one consonant, that consonant is lengthened, as in *hafði* [hav:ði] 'had.' These patterns are schematized in (6).

- (6) a. V:(C)# c. V:§ (# = word boundary;
b. VC:C# d. VC:§ § = syllable boundary)

If we reduce (6a and b) to (6c and d) by ignoring the word-final consonant, we obtain the generalization that the last segment in the syllable is long. I will formalize the notion of ignoring the word-final consonant by adopting Kiparsky's proposal [13]

that in Icelandic the last consonant in a word is extrametrical, that is, is not visible to rules applying to metrical structure. This constraint is based on work by Hayes [10] and Harris [9] which shows that a unit at the edge of a constituent may be ignored in prosodic systems such as stress and syllable structure. Consonant extrametricality in Icelandic is specified as in (7).

- (7) C → [+extrametrical]/_#

The extrametrical consonant is adjoined to the syllable after metrical rules have applied.

Stressed syllables ending in consonant clusters (excluding extrametrical consonants) are transcribed by Einarsson [6] with no length either on the vowel or on the postvocalic consonants, as in (8).

- (8) a. siglði [sylvði] 'sailed'
b. vinsþri [vinstru] 'left'
c. eflði [evlði] 'strengthened'
d. efltt [eflitt] 'strengthened'(p.p.)
e. vask [vask] 'sink' (gen.sg.)

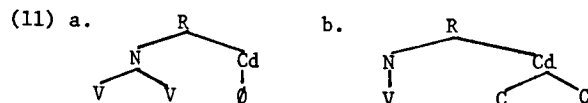
These examples show that a sequence of two consonants in the Rhyme is sufficient to make the syllable long (disregarding extrametrical consonants in (d) and (e)). Comparing (6) and (8) and abstracting from extrametrical consonants, we represent the Rhyme of a long (stressed) syllable as in (9).

- (9) a. V: b. VC: c. VC₁C₂

Adopting the terminology of autosegmental phonology, in which feature complexes are linked to timing slots in a CV skeleton, and assuming that geminates are linked to two timing slots, we summarize (9) as:

- (10) A long (stressed) syllable in Icelandic is one that has either two V slots or two C slots (but not both) at the end of the Rhyme.

(10) is diagrammed in (11).



Note how closely (10) and (11) approximate the traditional definition of a long syllable in Icelandic as one with a long vowel, or a long consonant in complementary distribution.

SYLLABIFICATION

I assume that syllable divisions in Icelandic are governed by the conventions in (12)-(14).

- (12) Syllable onsets conform to the sonority hierarchy in (1) (from Kiparsky [12]).

- (1) Vowels-Glides-r-l-Nasals-Fricatives-Stops
1 2 3 4 5 6 7

Numbers 1 to 7 are in order of decreasing sonority. Segments in an Onset must be in order of increasing sonority. An Onset may not contain two segments of the same sonority. Violations of (12) may occur word-initially, as in the *s* + stop or fricative in *stiga* 'to ascend,' *spara* 'to save,' *skattur* 'tax,' *svartur* 'black.'

- (13) Maximize the Coda of a syllable. However, clusters consisting of a voiceless stop (*p, t, k*) or *s* followed by a segment of sonority level 3 or higher (glide *j* or *r*), or a voiceless stop followed by *v*

are in the onset.

- (14) A non-null onset is preferred.

Rules (13) and (14) interact to give the syllable divisions *hesstur*, *hafði*, and *siglði*. If there is only one intervocalic consonant, it belongs to the Onset of the next syllable, as in *hafða*, showing that (14) has priority over (13). (13) applies crucially in *ofrun* [of:run], [ov:run] 'lifting' and *eifja* [ei:ja] 'skill,' where (12) would allow both intervocalic consonants in the Onset.

The exception statement in (13) accommodates the well-known cases where a stressed vowel in a disyllabic word is long preceding a sequence of *p, t, k*, or *s* followed by *j, v*, or *r*. These sequences regularly form onsets, as in *leppja* 'to lap up,' *snuþra* 'to rebuke,' *viðtja* 'to visit,' *veðkja* 'to awaken,' *vöðkva* 'to water,' *tiðtra* 'to shiver,' *aðkrar* 'fields,' *Eðsja* (name of a mountain), and *háðsra* 'hoarse' (gen.pl.). The first vowel is invariably long in these examples, e.g. [lɛ:pʰja], [snY:pʰra]. Onsets in *pv*, which are not attested, seem to be an accidental gap. An onset beginning with *sv* should not occur, since it violates the sonority hierarchy (12i), *s* and *v* being both of sonority level 6. We find that this is in fact the correct prediction. The standard example of an *sv* onset is *tvisvar* [tʰvi:sva] 'twice' [6]. However, Orešnik and Pétursson [17] point out that this is really a compound consisting of *tvi* + *svar* (cf. *þrisvar* 'thrice'), whose syllabification before *sv* is due to the presence of a word boundary before *svar*. As evidence that *sv* is not an Onset, they cite the following examples, which have a short vowel before *sv*: *hösvir* [hösviɹ] 'wolf,' *hösvast* [hösvast] 'potter about,' *hösvan* [hösvan] 'grey' (acc.sg.m.). By eliminating *sv* as a possible Onset, we avoid Garnes' claim [8] that *v* is a glide, which is meant to make *sv* conform to the sonority hierarchy.

The exception statement in (13) results in the syllabification *vinsþri* 'left' and *aumþkva* 'to pity.' Einarsson's transcriptions [6] of these as [vinstru] and [öym:kʰva] suggest that this is the right analysis.

LENGTHENING

I propose (15) and (16) to derive (11).

- (15) $\begin{matrix} N \\ | \\ V \end{matrix} \rightarrow \begin{matrix} N \\ | \\ V \\ | \\ V \end{matrix} / \text{---}]_R]_{\sigma_s}$ (σ = Syllable, s = strong.)

- (16) $\begin{matrix} Cd \\ | \\ C \end{matrix} \rightarrow \begin{matrix} Cd \\ | \\ C \\ | \\ C \end{matrix} / \text{---}]_R]_{\sigma_s}$

(15) and (16) are combined as (17).

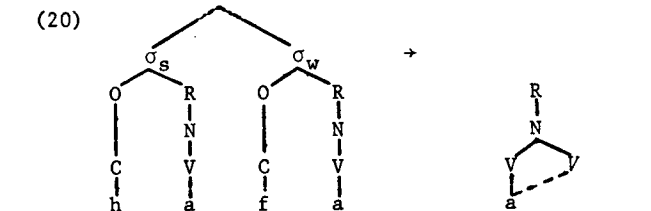
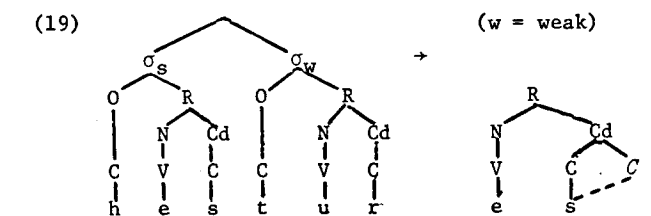
- (17) $\begin{matrix} U \\ | \\ X \end{matrix} \rightarrow \begin{matrix} U \\ | \\ X \\ | \\ X \end{matrix} / \text{---}]_R]_{\sigma_s}$ (U = Nucleus or Coda; X = V or C)

I assume with Kiparsky [13] and others that vowel length is not distinctive in Icelandic. I represent this by assigning only one V slot to the underlying Nucleus. (17) inserts a V slot in the Nucleus of a stressed syllable with an empty Coda, and inserts a C slot into the Coda of a stressed syllable with a Coda containing just one C slot. (17) applies after the final metrical structure of the word is determined, assuming Arnason's analysis [2] of

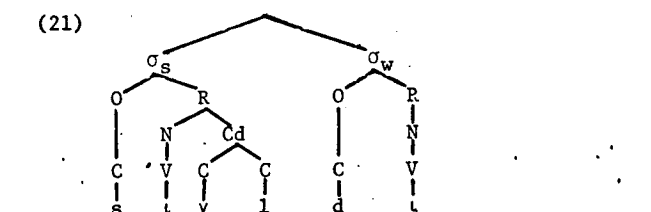
stressed syllables as strong. (17) applies postlexically, after operations that affect syllable structure, such as inflectional and derivational suffixation, attachment of clitics, and phonological rules such as u-Epenthesis, j-Deletion, and Syncope, as proposed by Kiparsky [13]. I assume the constraints on autosegmental representations given in Pulleyblank [18], namely that features are associated to timing units from left-to-right in a one-to-one relation, and that association lines do not cross. I also assume with Pulleyblank that spreading is not automatic. In Icelandic, spreading is rightward, as specified in (18).

- (18) $\begin{matrix} X & & X \\ | & & | \\ M & & M \end{matrix}$ (X = a skeletal slot V or C; M = a melody unit.)

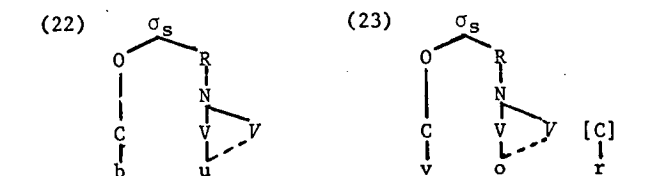
Applying Lengthening (17) and Spreading (18), I derive *hestur* and *hafa* in (19) and (20).

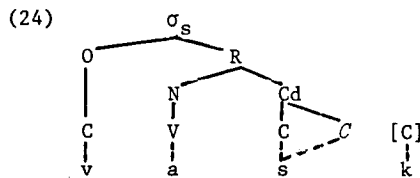


The structural change in (19), (20), and the derivations below shows only the affected Rhyme of the first syllable. Inserted slots are in italics. Lengthening (17) does not apply to *siglði* (21), so there is no change.

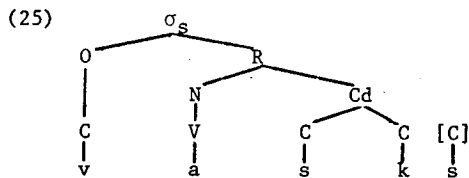


The monosyllables *bú*, *vask*, and *vor* [vo:r] 'spring' are derived in (22)-(24). Extrametrical consonants are enclosed in brackets; inserted V or C is in italics. I am simplifying Arnason's representations by omitting the weak empty syllable that completes the foot of a monosyllable.

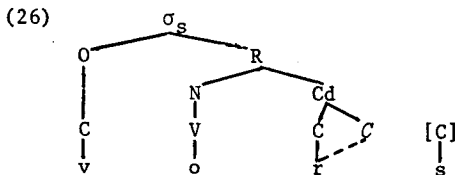




The last monosyllabic type is vasks (25). Here, Lengthening (17) does not apply.



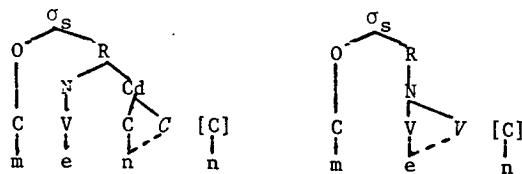
This analysis needs no additional rules to account for the alternation in length of the s in vask [vas·k] and vasks [vasks], which follows from the application of Lengthening (17) to the input structures in (24) and (25). The alternation in vowel length shown in vor [vo:r] and vors [vo:r's] 'spring' (gen.sg.) is likewise handled by Lengthening (17), which applies to vors in (26) to derive the short-vowel form. Compare (23), in which (17) derives a long vowel.



This alternation in vowel length occurs regularly when a consonantal suffix is added to a monosyllable ending in a single consonant, such as skip [skj:t:p^h] 'ship' and skips [skj:t:f·s] (gen.sg.); bát [bau:t^h] 'boat' (acc.sg.) and báts [baus:] 'boat' (gen.sg.). My analysis accounts for the alternation in vowel length, as well as the alternation in consonant length, by the general lengthening rule (17), without needing recourse to the additional shortening rule needed in Anderson's analysis [1]. (Consonant assimilations in these examples are due to other rules.)

Finally, the minimal pair menn and men (1a, 1b) are derived in (27) and (28).

(27) menn 'men' (28) men 'necklace'



The final nasal cluster in menn (27) is reduced by later rules to obtain the approximately equal duration found by Garnes [7] for menn and men.

To summarize, the rule of Lengthening (17), with the syllabification conventions (12)-(14), accounts for Icelandic syllable quantity in a simpler and more empirically adequate way than does the analysis proposed by Anderson [1], which appeals to additional syllable restructuring and shortening rules.

ACKNOWLEDGEMENTS

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REFERENCES

- [1] S. Anderson, "A metrical interpretation of some traditional claims about quantity and stress," in M. Aronoff, R. Oehrle, eds., *Language Sound Structure*, The MIT Press, 1984, 83-106.
- [2] K. Árnason, "Icelandic word stress and metrical phonology," *Studia Linguistica* 39, 93-129, 1985
- [3] K. Árnason, "The segmental and suprasegmental status of preaspiration in Modern Icelandic," *Nordic Journal of Linguistics* 9, 1-23, 1986.
- [4] H. Benediktsson, "The non-uniqueness of phonemic solutions: quantity and stress in Icelandic," *Phonetica* 10, 133-153, 1963.
- [5] S. Einarsson, *Beiträge zur Phonetik der isländischen Sprache*, Brøgger, Oslo, 1927.
- [6] S. Einarsson, *Icelandic*, Johns Hopkins Press, 1945.
- [7] S. Garnes, "Suprasegmental aspects of Icelandic vowel quality," *Working Papers in Linguistics* 17, Ohio State University, 144-159, 1974.
- [8] S. Garnes, "Perception, production and language change," *Chicago Linguistic Society Parasession on Functionalism*, 156-169, 1975.
- [9] J. Harris, *Syllable Structure and Stress in Spanish: a Non-Linear Analysis*, MIT Press 1983.
- [10] B. Hayes, "Extrametricity and English stress," *Linguistic Inquiry* 13, 227-276, 1982.
- [11] E. Haugen, "The phonemics of Modern Icelandic," *Language* 34, 55-88, 1958.
- [12] P. Kiparsky, "Metrical structure assignment is cyclic," *Linguistic Inquiry* 10, 421-441, 1979.
- [13] P. Kiparsky, "On the lexical phonology of Icelandic," in C. Elert, I. Johansson, E. Strangert, eds., *Nordic Prosody III*, Almqvist & Wiksell, 135-164, 1984.
- [14] I. Lehiste, "The function of quantity in Finnish and Estonian," *Language* 41, 447-456, 1965.
- [15] A.S. Liberman, "Stress in Icelandic," *Phonetica* 31, 125-143, 1975.
- [16] J. Ófeigsson, "Træk of moderne islandsk Lydlære," in S. Blöndal, ed., *Islensk-dönsk orðabók*, Gutenberg, Reykjavík, 1920, XIV-XXVII.
- [17] J. Orešnik, M. Pétursson, "Quantity in Modern Icelandic," *Arkiv* 92, 155-171, 1977.
- [18] D. Pulleyblank, *Tone in Lexical Phonology*, Reidel 1986.
- [19] H. Thráinsson, "On the phonology of Icelandic preaspiration," *Nordic Journal of Linguistics* 1, 3-54, 1978.