
Vowel harmony in an Old Norwegian manuscript

Overview:

- The manuscript AM 315 f fol. is one of the oldest Norwegian manuscripts.
 - Previous investigations have determined that the manuscript exhibits vowel harmony.
 - Statistical illustrations of the vowel harmony data will show that the harmony system is remarkably regular.
 - Based on a general impression of the manuscript, earlier scholars made claims about its vowel harmony patterns. Statistical analyses performed here will both confirm and disconfirm these claims.
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1 Manuscript AM 315 f fol.

1.1 General remarks

- (1) North-western manuscript from ca. 1200 (Hægstad 1907, Hødnebø & Rindal 1995).
- (2) Only short fragments of the manuscript remain, and much of it is in poor condition.

Linguistic analysis by Hægstad (1907):

- (3) Vowel harmony.
- (4) Preserved /*ǫ*/.
- (5) Preserved distinction between /*æ*/ and /*e*/.

A noteworthy linguistic trait not mentioned by Hægstad (1907) is the retention of vowel hiatus:

- (6) *þréa* (2.26), *þréatugu* (2.5), *féar* (3.13, 4.16), *áttéan* (189.2), *bóande* (2.18), *bóanda* (190.10).
- (7) But no hiatus remains in <frendr> (187.4) and <frendsime> (189.13).

1.2 Vowel harmony

- (8) The vowel harmony system in AM 315 f fol. has been analyzed in general terms by Hægstad (1907) and systematically by Johnsen (2003).

Vowel harmony according to Hægstad (1907) and Johnsen (2003):¹

Long vowels		
	Harmony trigger	Unstressed vowels
High	í ý ú	i u
Mid-high	(é) ó ó	e o
Mid-low	æ ô	e o
Low	á	e o

Table 1: Vowel harmony after long vowels

Short vowels		
	Harmony trigger	Unstressed vowels
High	i y u	i u
Mid-high	e (ø) o	e o
Mid-low	æ ø	i u
Low	a	e u

Table 2: Vowel harmony after short vowels

Diphthongs		
	Harmony trigger	Unstressed vowels
Diphthongs	æi øy au	i u

Table 3: Vowel harmony after diphthongs

1.3 Editions

- (9) There exist four published editions of AM 315 f fol. They are ranked below according to their reliability:

¹There is no data in this manuscript for the triggers /é/ and /ø/. Hægstad (1907) does not mention that /ô/ triggers a mid [e] in an unstressed syllable and that /ø/ triggers a high [i], despite the presence of the forms *nóttena* (4.1) and *hoggvit* (190.12).

- (10) 1. Karlgren 1904 (only first two leaves)
 - 2. Eithun et al. 1994 (used by Johnsen 2003)
 - 3. Storm 1885 (used by Hægstad 1907)
 - 4. Keyser & Munch 1846
- (11) A complete facsimile of AM 315 f fol. is published in Hødnebo & Rindal (1995).

2 A new look at AM 315 f fol.

The goal of this presentation is to take a new look at AM 315 f fol. for the following reasons:

- (12) Use a more reliable edition: Karlgren 1904.
- (13) Focus more on the patterns in the data with statistical illustrations.
- (14) Run statistical tests on the vowel harmony data.
- (15) Fit a statistical model to the vowel harmony data.

Principles for data collection:

- (16) Both the vowel triggering harmony and the vowel in a harmony position must be written in the manuscript and still be legible.
- (17) A form like <[...]gum> (1.8) is therefore not included as a token of *æigum*, even though it is hardly conceivable that anything but <æigum> was written in the manuscript.
- (18) Abbreviated forms like <ke> (187.3, Hødnebo & Rindal 1995:213) for *kononge* are also not included. Note that the abbreviation nevertheless respects the rules of vowel harmony.
- (19) Synchronically transparent compounds are not included, as these have secondary stress on the second element.
- (20) A form such as *ærendreka* (1.1) is therefore not included as an example of a vowel correspondence *e_e*.
- (21) Forms are included if the transparency of the compound is dubious, such as <orkym-lum> (3.23) and *anlet* (3.23).
- (22) All in all 603 relevant tokens in this manuscript.

3 Statistical illustrations

3.1 Data

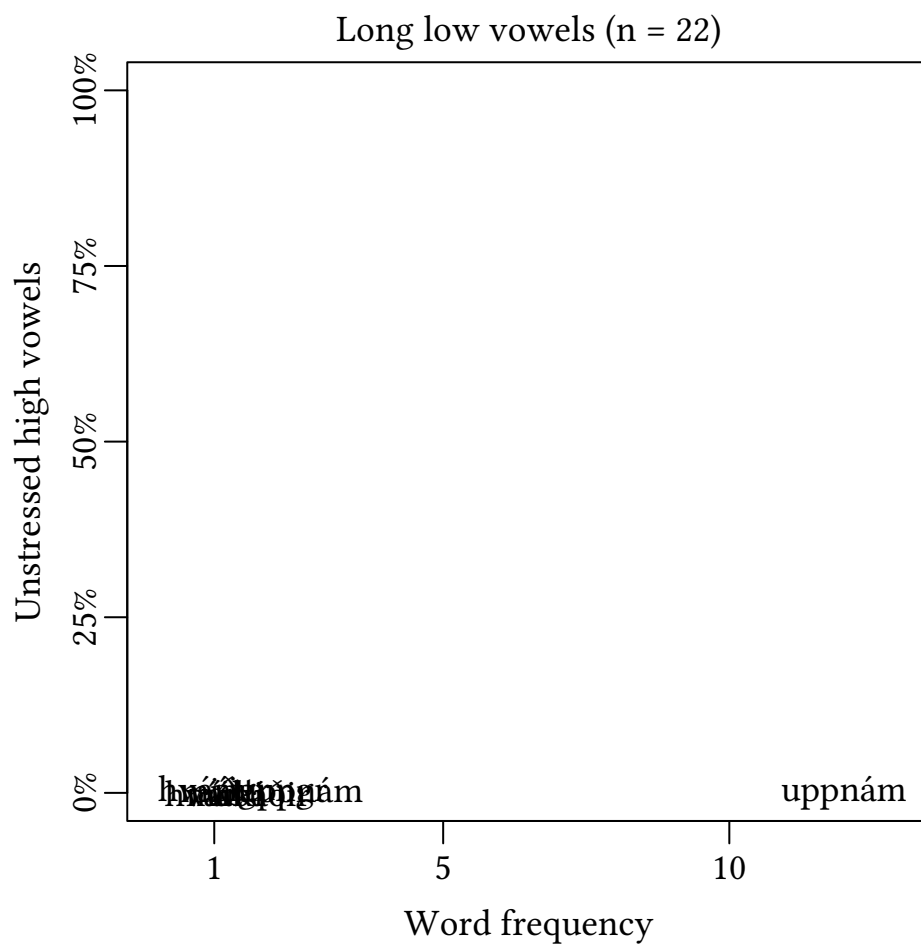


Fig. 1: Vowel harmony after long low vowels

(23) No exceptions to the rules in Table 1.

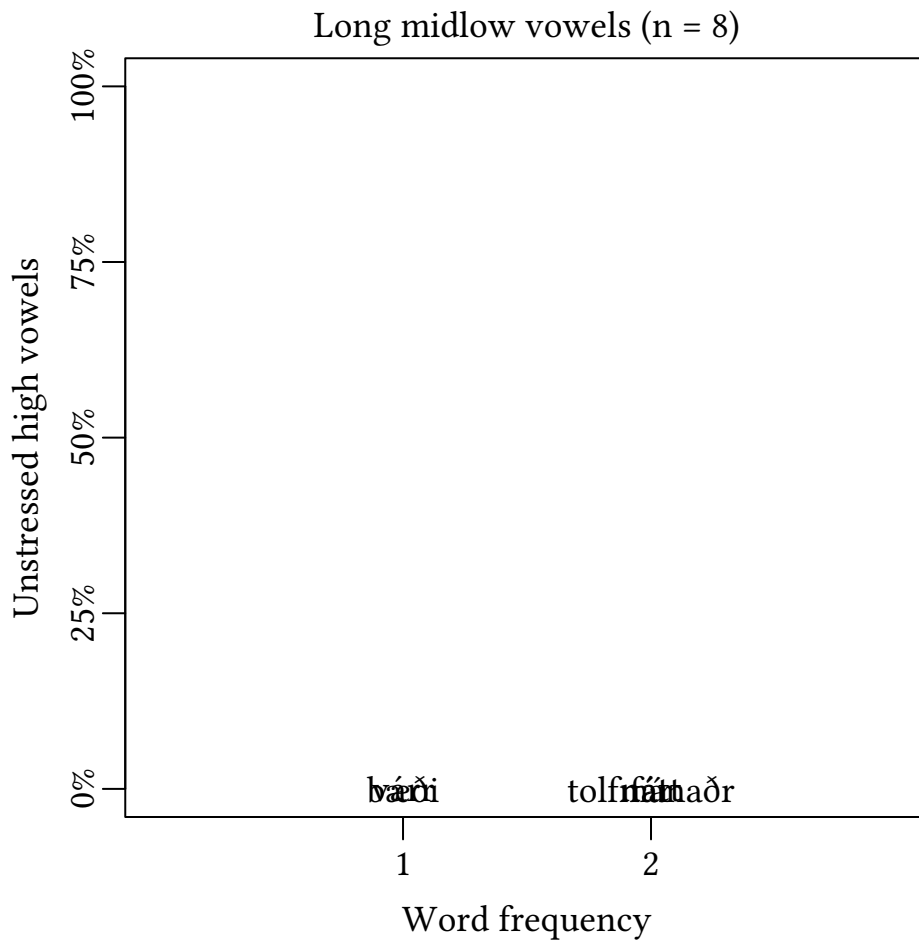


Fig. 2: Vowel harmony after long mid-low vowels

(24) Few tokens – no exceptions to the rules in Table 1.

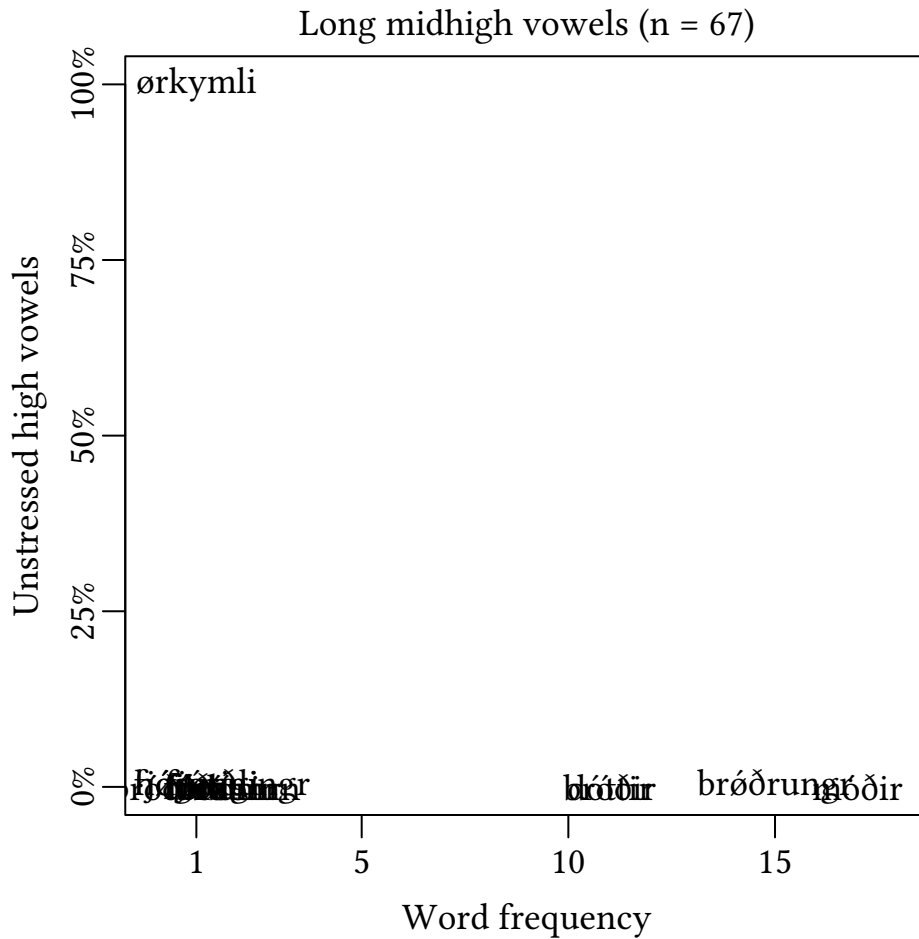


Fig. 3: Vowel harmony after long mid-high vowels

- (25) Many tokens – one single possible exception to the rules in Table 1.
- (26) It is not clear, however, what the length of the vowel <o> in <orkymlum> is (tagged here as long).
- (27) The vowel <y> is an indication that the vowel is not unstressed.
- (28) The word is otherwise normalized as *ørkymli* with secondary stress on *-kymli-* (Hegstad et al. 2008).

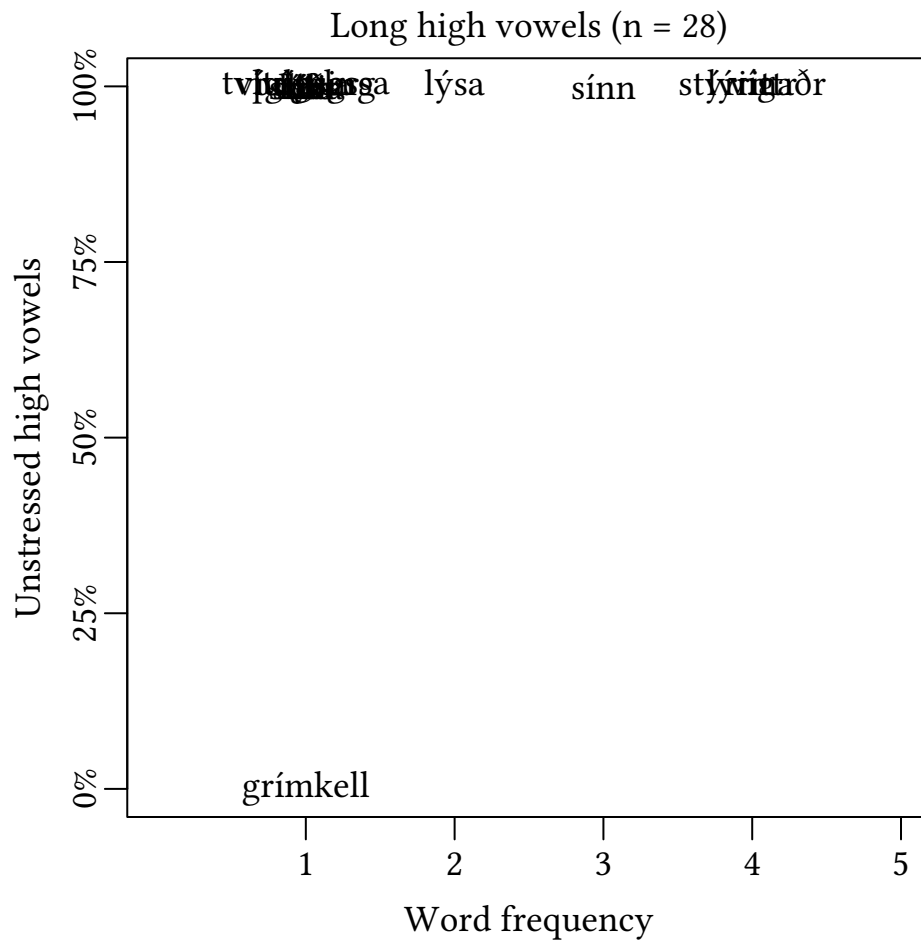


Fig. 4: Vowel harmony after long high vowels

- (29) Only one exception to the rules in Table 1.
- (30) The exception *grímkell* is normalized with secondary stress by Heggstad et al. (2008).

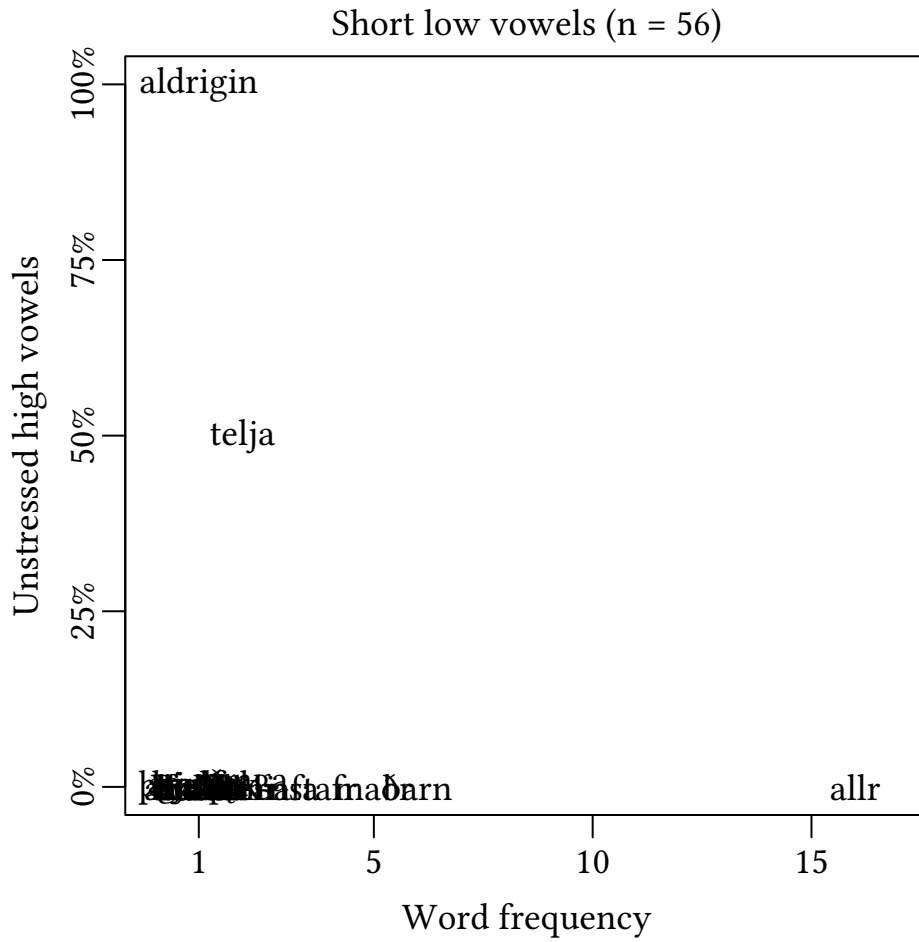


Fig. 5: Vowel harmony of front vowels after short low vowels

(31) Many examples – only two exceptions to the rules in Table 2.

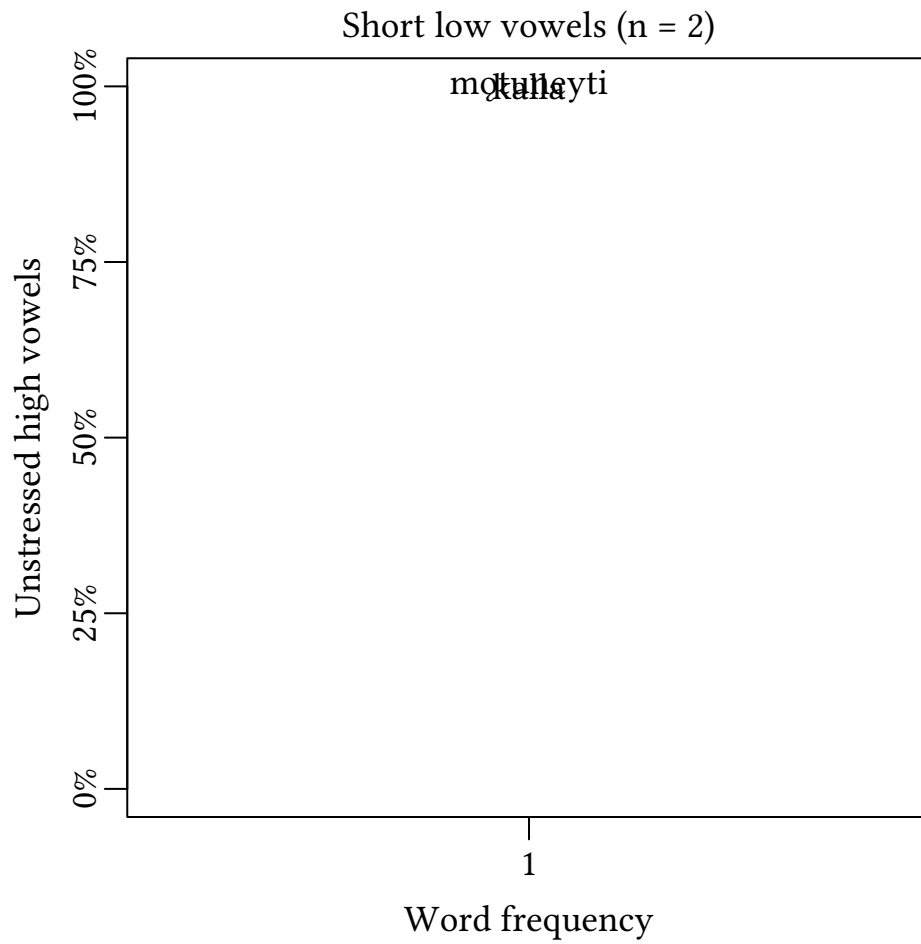


Fig. 6: Vowel harmony of back vowels after short low vowels

(32) Only two examples – no exceptions to the rules in Table 2.

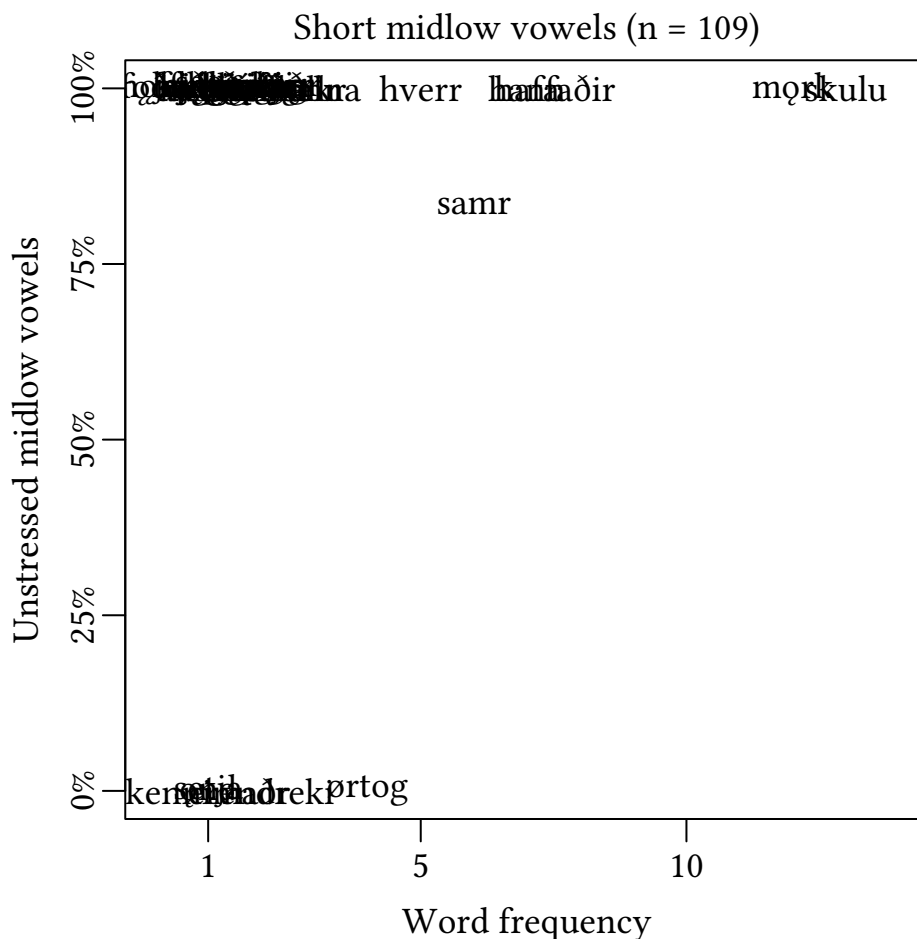


Fig. 7: Vowel harmony after short mid-low vowels

- (33) A lot of examples – very few exceptions to the rules in Table 2.
- (34) The spellings <honum> and <skolu> are taken as tokens of *hǫnum* and *skǫlu*. There are no examples of <honom> and <skolo> in this manuscript, which would indicate *honom* and *skolo*.
- (35) For *hǫnum*, cf. Modern Icelandic *hönum* and Old Trøndsk *hanum* (Hægstad 1907:43, 1942:42).
- (36) For *skǫlu*, cf. Old Trøndsk *skalu* (Hægstad 1899:57, 1907:43).
- (37) The most frequent exception, *ortog*, is normalized with secondary stress by Heggstad et al. (2008).

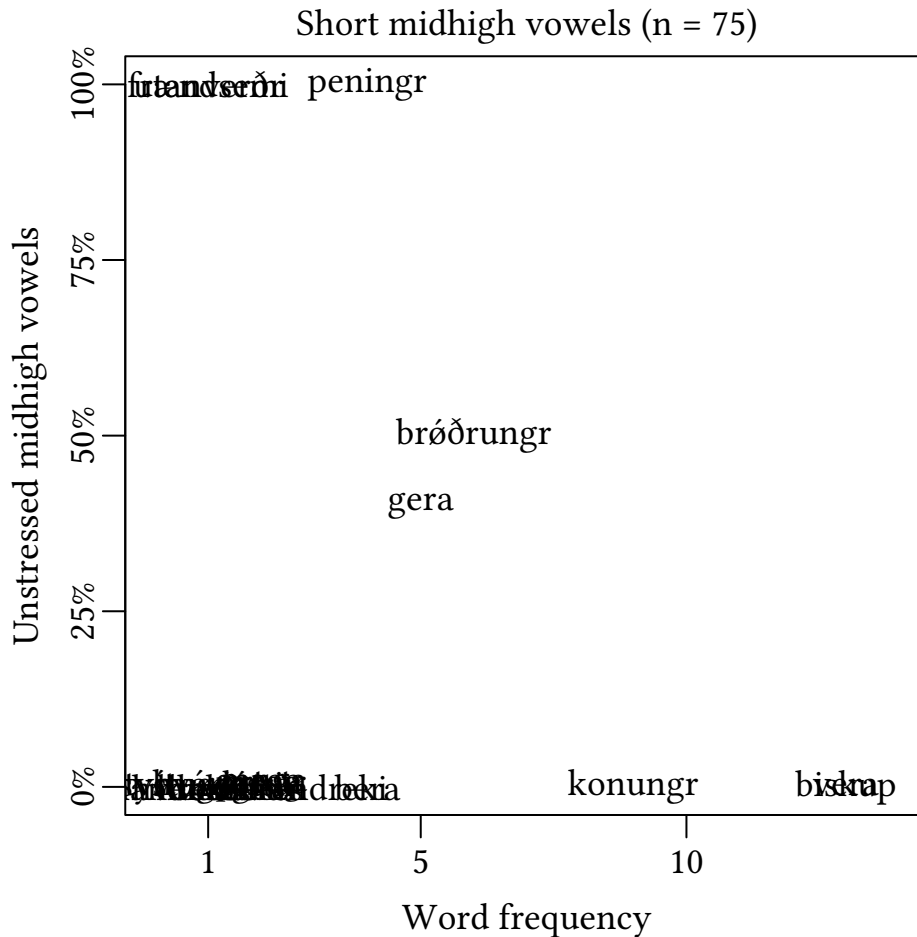


Fig. 8: Vowel harmony after short mid-low vowels

- (38) Many tokens – few exceptions to the rules in Table 2.
- (39) A noticeable exception is the word *peningr*, which always has *-ing-*, even if the first syllable varies between *pen-* (four times) and *pæn-* (twice).
- (40) Hægstad (1907) claims that the suffix *-ing-* undergoes vowel harmony in this manuscript. But there are no examples of *-eng-*.
- (41) The suffix *-ung-*, on the other hand, clearly undergoes vowel harmony here, cf. *áttong-*, *bróðrongr*, *ffórðong-*, and *konong-* vs. *systrungr* and *þriðung-*. These words occur frequently and there are no exceptions.
- (42) Another noticeable exception is the dat.sg. form *bróðrongi* with *o_i* (three times), never with *o_e*.

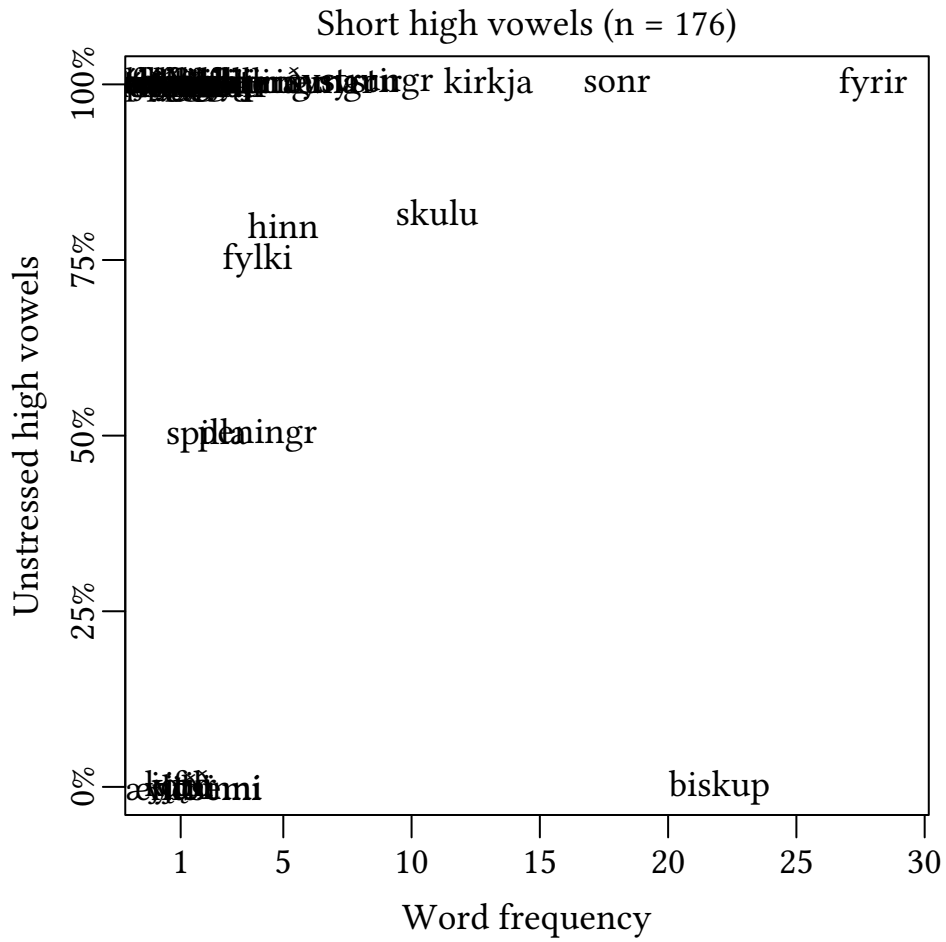


Fig. 9: Vowel harmony after short high vowels

- (43) A lot of examples – few exceptions to the rules in Table 2.
- (44) One *consistent* exception is the word *byskop*, which is always written with y_o (n = 22). This word probably has secondary stress on the vowel *o* (Johnsen 2003).

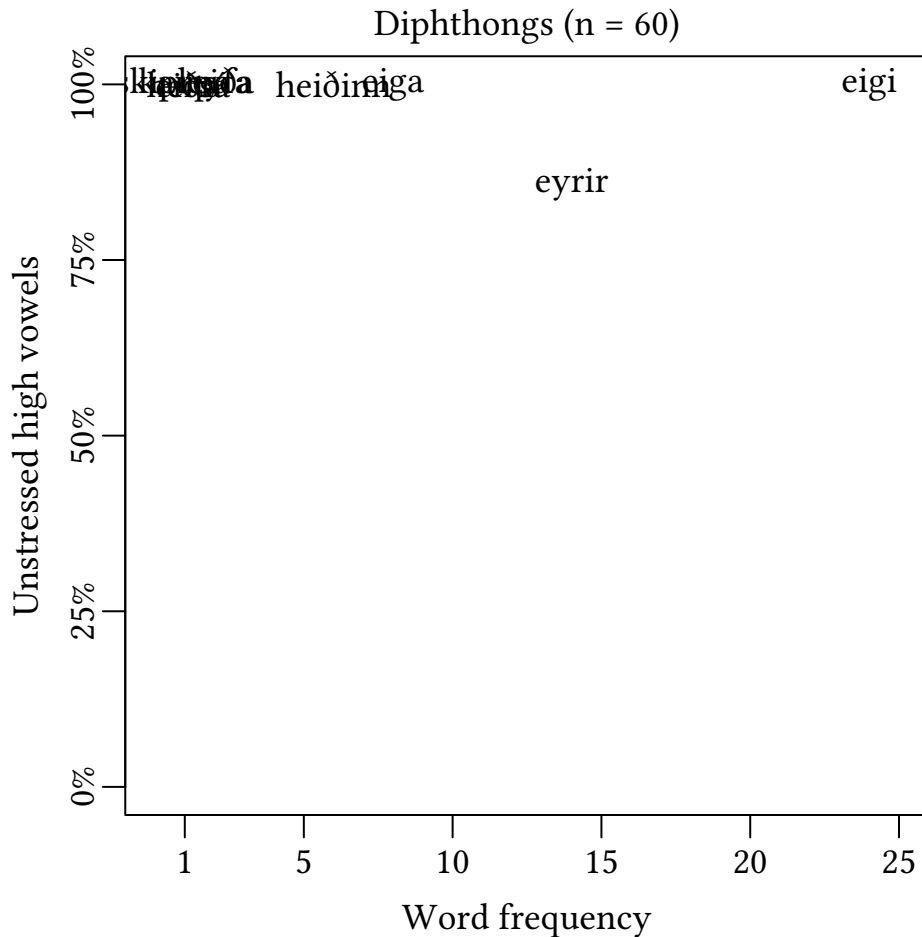


Fig. 10: Vowel harmony after diphthongs

(45) Many examples – very few exceptions to the rules in Table 3.

(46) The only exception is the twice occurring *øyre*.

3.2 Summary

(47) The vowel harmony in AM 315 f fol. is remarkably regular.

(48) There are almost no exceptions to the vowel harmony rules in Tables 1–3.

(49) The few exceptions that exist are mostly words with secondary stress on the vowel in the harmony position, and so they should be removed from the data set.

4 Statistical analyses

4.1 Tendency towards [e] and [o]?

(50) Hægstad (1907) claims there is a ‘tendency towards [e] and [o]’ in the manuscript.

- (51) We can create a fake version of AM 315 f fol. where there are no exceptions to the vowel harmony rules in Tables 1–3.
- (52) Then we can compare the distribution of high vowels [i] and [u] in vowel harmony positions between these two manuscripts.
- (53) Words which are normalized with secondary stress on the vowel in a harmony position are removed here. These are *erendreki*, *frændsemi*, *Grímkell*, *hvervetna*, *hógendi*, *ørkymli*, and *ørtog* (n = 11). The word *biskup* is also removed (n = 22).
- (54) Hægstad is right in that the proportion of high vowels is actually lower in AM 315 f fol. (59 %) than we would expect from the vowel harmony rules (61 %).
- (55) But this difference is very small and not statistically significant (Student’s unpaired one-sided t-test: $t(1138) = -0.6$, $p = 0.27$).

4.2 Tendency towards [e] and [o] in final position?

- (56) Hægstad (1907) also claims the tendency towards [e] and [o] is stronger in the final position of the word.
- (57) We can test the effect of this position by fitting the vowel harmony data to a logistic regression model.
- (58) The two examples of *a_u* are now removed from the data, as these two forms prevent a meaningful test of the effect of short low vowels on vowel height.

	Estimate	Standard error	z value	Probability
Intercept (short high vowels)	2.969	0.472	6.288	95 %
Short mid-high vowels	-3.995	0.443	-9.024	26 %
Short mid-low vowels	1.275	0.580	2.200	99 %
Short low vowels	-4.534	0.586	-7.741	17 %
Diphthongs	1.178	0.769	1.532	99 %
Long (high) vowels	17.446	2041.146	0.009	100 %
Long mid-high vowels	-35.335	2429.714	-0.015	< 0.01 %
Long mid-low vowels	-40.678	4248.352	-0.010	< 0.01 %
Long low vowels	-34.629	3043.257	-0.011	< 0.01 %
Final position (short high vowels)	-1.097	0.471	-2.332	87 %

Table 4: Logistic regression model

- (59) The model estimates that the probability of an unstressed high vowel is 95 % in a form like *skiftir*, but 87 % in a form like *skifti* with the vowel in final position.
- (60) This difference is significant (likelihood ratio test: $\chi^2(1) = 5.89$, $p = 0.015$).
- (61) So Hægstad is right.
- (62) The model also confirms the overwhelming regularity of vowel harmony in this manuscript.

5 Conclusion

- (63) The manuscript AM 315 f fol. is one of the oldest Norwegian manuscripts, and dates to ca. 1200.
- (64) The text exhibits vowel harmony.
- (65) Statistical illustrations and analyses confirm that the vowel harmony system in this manuscript is overwhelmingly regular.
- (66) Statistical analyses also confirm Hægstad's (1907) claim that there is a tendency towards the vowels [e] and [o] in the final position of the word.
- (67) This study demonstrates the usefulness of adding statistical methods to the toolbox used by philologists and historical linguists.

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