

---

# Vowel reduction in Old English

---

## Overview:

- In Old English, an original unstressed  $*\bar{o}$  is in some morphological categories reflected as variation between  $u$  and  $a$ .
  - The traditional explanation is that  $*\bar{o}$  generally developed to  $a$ , but developed to  $u$  when the following syllable also had a  $*u$ .
  - My hypothesis is that  $*\bar{o}$  reduced to  $u$  in medial syllables due to the short duration of such syllables.
  - A statistical study of an Old English corpus strongly supports my new hypothesis, and finds no support for the traditional explanation.
- 

## 1 van Helten's rule

An original unstressed  $*\bar{o}$  generally develops to  $a$  in Old English:

(1)	PROTO-WEST-GERMANIC		OLD ENGLISH	
	$*dag\bar{o}s$	>	$dagas$	'days'
	$*gl\bar{o}f\bar{o}z$	>	$gl\bar{o}fa$	'gloves'
	$*wund\bar{o}pi$	>	$wundap$	'woundeth'
	$*tung\bar{o}ni$	>	$tungan$	'tongue'

In the past tense forms of  $\bar{o}$ -verbs, however, both  $u$  and  $a$  are found as reflexes of the original unstressed  $*\bar{o}$ :

(2)	Pret.	$andswar\underline{u}de$	~	$andswar\underline{a}de$	'answered'
	Pret.	$syng\underline{u}de$	~	$syng\underline{a}de$	'sinned'
	Perf.	$wund\underline{u}d$	~	$wund\underline{a}d$	'wounded'
	Perf.	$bisg\underline{u}d$	~	$bisg\underline{a}d$	'busied'

According to van Helten (1891), the *\*ō* was raised to *u* when the following syllable also contained a *\*u*:

(3)		PROTO-WEST-GERMANIC		OLD ENGLISH	
	Pret.3.sg.	<i>*wundōdē</i>	>	<i>wundade</i>	‘wounded’
	Pret.3.pl.	<i>*wundōdun</i>	>	<i>wundudun</i>	‘wounded’

This process predates Old English, so it applies even if the following *\*u* should later be lost:

(4)		PROTO-WEST-GERMANIC		OLD ENGLISH	
	Perf.m.nom.sg.	<i>*wundōdaz</i>	>	<i>wundad</i>	‘wounded’
	Perf.f.nom.sg.	<i>*wundōdu</i>	>	<i>wundud</i>	‘wounded’

- (5) All the main grammars of Old English accept van Helten’s rule (Bülbring 1902, Luick 1921, Girvan 1931, Kieckers 1935, Campbell 1959, Brunner 1965, Hogg 1992, Hogg & Fulk 2011).
- (6) The rigid system predicted by van Helten’s rule in (3) and (4) is not what we find in Old English. As seen in (2), there is much variation between *u* and *a*.
- (7) The system in (3) and (4) must therefore represent ‘very early Old English’ (i.e. before the language is attested in manuscripts).
- (8) The actual attested variation seen in (2) is due to a later generalization of *u* and *a* within the paradigm (Luick 1921, Girvan 1931, Kieckers 1935, Campbell 1959, Brunner 1965, Hogg 1992, Hogg & Fulk 2011).

## 2 Testing van Helten’s rule

- (9) If van Helten’s rule is correct, we would expect to find *u* more often in those forms where an original *\*u* followed than elsewhere.
- (10) All past tense forms of *ō*-verbs (*n* = 457) were gathered from the manuscript Hatton 20 (Sweet 1871):
  - Written in Old West Saxon (‘standard’ Old English) around 890.
  - The largest early Old English text (67,835 words).

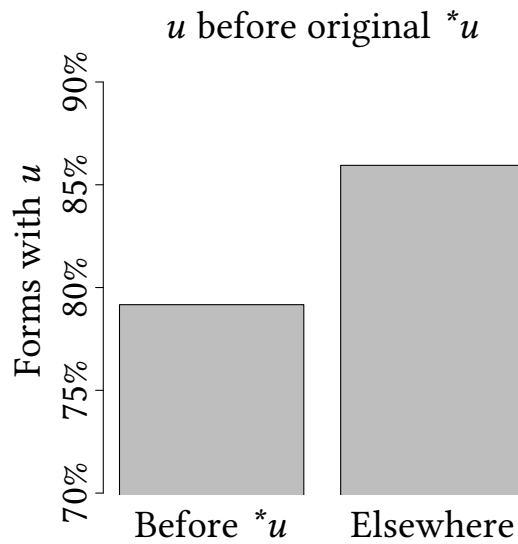


Fig. 1: van Helten's rule

Results:

- (11) The *u* is not more common before an original *\*u* than elsewhere. It is actually *less* common in this position.
- (12) This difference is nevertheless not significant (mixed effects logistic regression,  $p = .34$ ).

Conclusion:

- (13) van Helten's rule does not explain the distribution of *u* and *a* as the reflexes of original *\*ō*.

### 3 Vowel reduction

#### 3.1 Vowel duration & position

- (14) Unstressed vowels are shorter than stressed vowels (Fry 1955).
- (15) Unstressed vowels are shorter in medial syllables than in final syllables (Delattre 1966) :
  - ['makat] > ['makatan]

#### 3.2 Vowel duration & vowel height

- (16) The articulators need to travel a longer distance for low vowels than for high vowels (Lindblom 1967).
- (17) High vowels are shorter than low vowels (Lehiste 1970):
  - [a] > [u]

### 3.3 Vowel duration & vowel raising

- (18) The shorter the vowel, the less time the articulators have to reach their targets.
- (19) Since low vowels require more time to be articulated, unstressed low vowels tend to raise when their duration decreases (Lindblom 1963) :

$$\bullet \quad \frac{\text{Less time}}{[a] > [\text{ɔ}] > [o] > [u]} \rightarrow$$

## 4 New hypothesis

Applying the findings in Section 3 to Old English:

- (20) Vowels are shorter in medial syllables (15):

$$\bullet \quad \text{wund}\underline{\text{V}}de - \text{wund}\underline{\text{V}}d \text{ 'wounded'}$$

- (21) Shortened vowels tend to raise (19):

PROTO-WEST-GERMANIC		'PROTO-OLD-ENGLISH'		OLD ENGLISH
*wund <u>ō</u> dē	>	*wund <u>ö</u> de	>	wund <u>u</u> de
*wund <u>ō</u> du	>	*wund <u>o</u> d	>	wund <u>a</u> d

New hypothesis:

- (22) The vowel *u* should be more common in medial syllables than in final syllables.
- (23) Distribution of *u* according to syllable position in the same corpus as in (10):

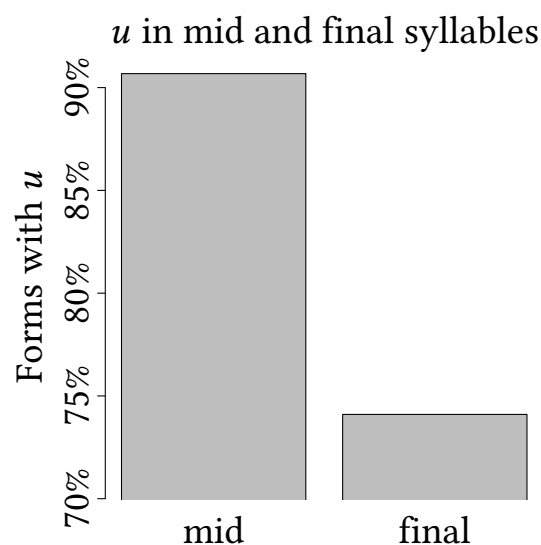


Fig. 2: New hypothesis

Results:

- (24) The *u* is significantly more common in medial syllables than in final syllables ( $p = .001$ ).

Conclusion:

- (25) The distribution of *u* lends support to the hypothesis that it is the result of vowel raising in shortened medial syllables.

## 5 Vowel reduction and phonology

How do we explain the connection between vowel shortening and vowel raising?

- (26) ‘Evolutionary Phonology’

- Articulatory origin: The physiological difficulty of producing shortened low vowels causes the articulators to miss their target (Lindblom 1963).
- Perceptual origin: Listeners are aware that high vowels are shorter than low vowels (Gussenhoven 2004), which causes them to misperceive a shortened vowel as a higher vowel (cf. Hillenbrand et al. 2000).
- Listeners reanalyze the raised vowel as the intended grammatical output (cf. Ohala 1981).

- (27) ‘Functional Phonology’

- The grammar instructs the speaker to raise shortened low vowels in order to minimize articulatory effort (Flemming 2004).

- (28) Both approaches predict that shortened low vowels will show a tendency to raise, so the choice between them should be based on general methodological principles.

## 6 Conclusion

- (29) An original unstressed *\*ō* generally develops to *a* in Old English. In some cases, however, it gives *u* in variation with *a*.
- (30) The traditional explanation (van Helten’s rule) is that *\*ō* developed to *u* when another *\*u* followed in the next syllable.
- (31) I have suggested that the development to *u* is the result of vowel raising in shortened medial syllables.
- (32) A statistical analysis of Old English forms strongly supports my hypothesis, and finds no support for the traditional explanation.

- (33) The exceptional development of \**ō* to *u* in Old English can thus be explained by a well-established connection between vowel shortening and vowel raising.

## References

- Bülbring, Karl D[aniel] (1902). *Altenglisches Elementarbuch*. I. Teil: Lautlehre. Sammlung germanischer Elementarbücher. I. Reihe: Grammatiken 4. Heidelberg: Carl Winter's Universitätsbuchhandlung.
- Brunner, Karl (1965). *Altenglische Grammatik*. Dritte, neubearbeitete Auflage. Sammlung kurzer Grammatiken germanischer Dialekte. A. Hauptreihe 3. Nach der angelsächsischen Grammatik von Eduard Sievers. Tübingen: Max Niemeyer.
- Campbell, A[listair] (1959). *Old English Grammar*. Reprinted from corrected sheets of the first edition. 1969. Oxford: Oxford University Press.
- Delattre, Pierre (1966). A comparison of syllable length conditioning among languages. *International Review of Applied Linguistics in Language Teaching* 4.3, 183–198.
- Flemming, Edward (2004). Contrast and perceptual distinctiveness. In: *Phonetically based phonology*. Ed. by Bruce Hayes, Robert Kirchner, & Donca Steriade. Cambridge: Cambridge University Press, 232–276.
- Fry, D[ennis] B[utler] (1955). Duration and intensity as physical correlates of linguistic stress. *The Journal of the Acoustical Society of America* 27.4, 765–768.
- Girvan, R[itche] (1931). *Angelsaksisch handboek*. Oudgermaansche handboeken 4. Haarlem: H. D. Tjeenk Willink & Zoon.
- Gussenhoven, Carlos (2004). Perceived vowel duration. In: *On Speech and Language. Studies for Sieb G. Nootboom*. Ed. by Hugo Quené & Vincent van Heuven. LOT Occasional Series 2. Utrecht: Netherlands Graduate School of Linguistics (LOT), 65–71.
- Helten, W[illem] van (1891). Grammatisches. *Beiträge zur Geschichte der deutschen Sprache und Literatur* 15, 455–488.
- Hillenbrand, James M[ichael], Michael J[oseph] Clark, & Robert A[lphonse] Houde (2000). Some effects of duration on vowel recognition. *The Journal of the Acoustical Society of America* 108.6, 3013–3022.
- Hogg, Richard M[ilne] (1992). *A Grammar of Old English*. Vol. 1: Phonology. Oxford: Blackwell.
- Hogg, Richard M[ilne] & R[obert] D[ennis] Fulk (2011). *A Grammar of Old English*. Vol. 2: Morphology. Chichester: Wiley-Blackwell.
- Kieckers, Ernst (1935). *Altenglische Grammatik*. Huebers kurze Grammatiken. München: Max Hueber.
- Lehiste, Ilse (1970). *Suprasegmentals*. Cambridge, MA: The M.I.T. Press.
- Lindblom, B[jörn] (1963). Spectrographic study of vowel reduction. *The Journal of the Acoustical Society of America* 35.11, 1773–1781.
- Lindblom, B[jörn] (1967). Vowel duration and a model of lip mandible coordination. *Speech Transmission Laboratory – Quarterly Progress and Status Report* 8.4, 1–29.
- Luick, Karl (1921). *Historische Grammatik der englischen Sprache*. Vol. 1.1. Leipzig: Chr. Herm. Tauchnitz.
- Ohala, John J[erome] (1981). The listener as a source of sound change. *Chicago Linguistic Society (CLS)* 17.2, 178–203.
- Sweet, Henry, ed. (1871). *King Alfred's West-Saxon Version of Gregory's Pastoral Care*. Early English Text Society 45. London: N. Trübner.