

Xĕλōk Sound Changes: A Cheat Sheet

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While Xĕλōk is distinct enough from its Esperanto ancestor to be reasonably considered a separate language at this juncture, its orthography does not reflect this. While syntactic and semantic changes are reflected to a fairly reasonable extent in the orthography, phonological changes are not accounted for. As a result, to reasonably approximate the pronunciation of a Xĕλōk word from how it is written, one must understand which sound changes have occurred from the ‘original’ (hereafter ‘Zamenhofian’) Esperanto.

Note that some sound changes listed apply only to the Lowlands dialect but not to the Highlands dialect, or vice-versa. This is indicated when it is the case.

Zamenhofian Esperanto Orthography

The Esperanto pronunciation of a word tends to be roughly equivalent to its spelling in IPA, with the following exceptions:

⟨c⟩	⟨ĉ⟩	⟨ĝ⟩	⟨ĵ⟩	⟨ŝ⟩	⟨ŭ⟩	⟨v⟩
/ts/	/tʃ/	/dʒ/	/ʒ/	/ʃ/	/w/	/v/

Primary stress falls on the penultimate syllable, and secondary stress *tends* to fall on alternating syllables preceding it.

1 Zamenhofian Esperanto to *Esperantelo*

1.1 /v/ becomes [w] when it would naturally fit in the sonority hierarchy of a consonant cluster and [v] elsewhere

$$\begin{aligned} v &\rightarrow w / C_ \\ v &\rightarrow v / \textit{elsewhere} \end{aligned}$$

e.g., ‘*kvar*to’ [ˈkvar.to] → [ˈkwar.to], ‘*evakui*’ [e.vaˈku.i] → [e.vaˈku.i]

1.2 Stress moves to the last syllable of correlatives and forms of ‘*esti*’

e.g., ‘*tiel*’ /ˈti.el/ → /tiˈel/, ‘*estas*’ /ˈe.stas/ → /eˈstas/, etc.

1.3 /i/ and /u/ → /j/ and /w/ before a stressed vowel

e.g., ‘*duo*.no’ [duˈono] → [ˈdwo.no], ‘*tiel*’ [tiˈel] → [tjel], etc.

1.4 Nasals assimilate in place of articulation to a following obstruent

$N \rightarrow m / _ \{p, b, f\}$

$N \rightarrow n / _ \{t, d, t', d', s, z, \int, \mathfrak{z}\}$

$N \rightarrow \eta / _ \{k, g\}$

e.g., 'enblövi' [en'blöwi] → [em'blo.wi]

1.5 Obstruents assimilate in voicing to a following obstruent

e.g., 'absolute' [ab.so'lu.te] → [ap.so'lu.te]

1.6 Sonorants assimilate in voicing to a preceding stop

e.g., 'plua' ['plu.a] → ['p̥lu.a]

1.7 Clusters of mixed sibilants assimilate to the last sibilant

e.g., 'disʃeti' [dis'ʃe.ti] → [diʒ'ʃe.ti]

1.8 Vowel hiatuses are broken up by epenthetic consonants

- If both consonants are the same, the epenthetic consonant is a glottal stop.

[a.a] → [aʔa] [e.e] → [eʔe] [i.i] → [iʔi] [o.o] → [oʔo] [u.u] → [uʔu]

- If the first non-low vowel is front, the epenthetic consonant is [j]

[i.e] → [ije] [i.a] → [ija] [i.o] → [ijo] [i.u] → [iju]
[e.i] → [eji] [e.a] → [eja] [e.o] → [ejo] [e.u] → [eju]
[a.i] → [aji] [a.e] → [aje]

- If the first non-low vowel is back, the epenthetic consonant is [w]

[o.i] → [owi] [o.e] → [owe] [o.a] → [owa] [o.u] → [owu]
[u.i] → [uwi] [u.e] → [uwe] [u.a] → [uwa] [u.o] → [uwo]
[a.o] → [awo] [a.u] → [awu]

1.9 Velar obstruents become palatal before front vowels

$k \ g \rightarrow \text{c } \int / _ \{i, e\}$

e.g., 'kilogramo' [ki.lo'gra.mo] → [ci.lo'gra.mo]

1.10 Diphthongs turn into stressed (long) monophthongs

ij → i: uj → y: aj ej → e: oj ew → ø: aw → o:

Note that this only occurs when the glide is clearly part of a diphthong, not in contexts like prevocalically where it's more of a consonant.

e.g., 'kajto' ['kaj.to] → ['ke:to] but 'kajako' [ka'ja.ko] → [ka'ja.ko]

1.11 Glides fricative intervocalically or word-initially (i.e., when it would be the sole onset of a syllable according to the maximum onset principle)

$$j \ w \rightarrow \text{ɹ} \ v \ / \ \# _ , \ V_V$$

e.g., 'ejakuli' [e.ja'ku.li] → [e.ɹa'ku.li] but 'ajna' [aj.na] → [e:na] but 'antaŭa' [an'ta.wa] → [an'ta.va]

1.12 Glottal stop and glottal fricative merge (differs by dialect)

LOWLANDS: /ʔ/ → /h/

HIGHLANDS: /h/ → /ʔ/

1.13 LOWLANDS: Standalone obstruents are voiced intervocalically

e.g., 'ŝipo' [ʃi.po] → [ʃi.bo]

1.14 Intervocalic geminates become single occurrences of the consonant in question

e.g., 'disŝuti' [diʃʃu.di] → [diʃu.di]

1.15 Ablaut

If the last vowel in a word is back rounded, the preceding vowel is rounded (regardless of intervening consonants).

e.g., 'kato' [ka.to] → [kɔ.to], 'iros' [i.ros] → [y.ros], 'ekzemplo' [ek'sem.plo] → [ek'səm.plo]

If the last vowel in a word is front, the preceding vowel is fronted (regardless of intervening consonants).

e.g., 'havis' [ha.vis] → [hæ.vis], 'ofte' [of.te] → [øf.te], 'seksumi' [sek'su.mi] → [sek'sy.mi]

1.16 Vowels are nasalized before nasal consonants, and nasal consonants are deleted when they precede obstruents

e.g., 'ankaŭ' [bn.ko:] → [b̃.ko:]

1.17 HIGHLANDS: Standalone obstruents are voiced intervocalically

e.g., 'ŝipo' [ʃy.po] → [ʃy.bo], 'disŝuti' [diʃy.ti] → [diʃy.di], 'ankaŭ' [b̃.ko:] → [b̃.go:]

1.18 Unstressed short vowels become schwa

e.g., 'Esperanto' [e.spe'rɔ.to] → [e.spə'rɔ.tə], 'tajfuno' [te:fu.no] → [te:fu.nə]

2 Esperantelo to Xēλōk

2.1 /l/ becomes [w] when it follows a vowel and does not precede a vowel

$$l \rightarrow w \ / \ V_C , \ V_ \#$$

2.2 When /r/ follows a vowel and does not precede a vowel, it rhotacizes the preceding vowel and disappears

$$Vr \rightarrow V^{\circ} \ / \ _C , \ _ \#$$

2.3 Schwa is deleted when the result wouldn't be a total mess sonority-wise

e.g., 'Esperanto' [e.spə'rɔ̃.tə] → [e'sprɔ̃t]

If the schwa is *nasal* and *precedes and obstruent*, that obstruent becomes nasal if voiced and voiced if voiceless. If this happens, the next vowel in the word is nasalized.

e.g., 'Esperantelo' [əspe.rɔ̃'tø.lə] → [sper'dø̃l]

If the schwa is *rhotic* and *precedes a coronal*, said coronal becomes retroflex.

$$t \rightarrow \text{ɬ} \quad d \rightarrow \text{ɖ} \quad s \rightarrow \text{ʂ} \quad z \rightarrow \text{ʐ} \quad \text{ts} \text{ tʃ} \rightarrow \text{tʂ} \quad \text{dz} \text{ dʒ} \rightarrow \text{dʐ}$$

e.g., 'sardino' [sə'dĩ.nə] → [sɖĩ̃n]

2.4 Liquids become glides after sonorants

$$l \text{ r} \rightarrow j \text{ w} / S_-$$

e.g., 'malebla' ['mlebl] → [mjeb̥l]

2.5 Front vowels are raised and back vowels fronted after palatal consonants

$$\begin{array}{llll} \emptyset \text{ u} \rightarrow y & o \rightarrow \emptyset & \text{ɔ} \rightarrow \text{œ} & \\ a \rightarrow \text{æ} & \text{æ} \rightarrow e & e \rightarrow i & \end{array} / \{c, ɟ, ɲ, j\}_-$$

2.6 Vowels become nasalized after glottals

$$V \rightarrow \tilde{V} / \{ʔ, h, ɦ\}_-$$

A non-phonemic tonal downstep is also applied to the relevant syllable. Ordinarily, this non-phonemic downstep happens alongside the syllable marked with primary stress.

e.g., 'kohorto' [khɔ̃'t] → [khõ̃'t], 'viandhaketafo' [vjæ̃.dhak'tɔ̃ʒ] → [vjæ̃'dhāk'tɔ̃ʒ]

2.7 LOWLANDS: Stops followed by a glottal fricative of the same voicing become fricatives. Fricatives followed by a glottal fricative assimilate to that fricative in voicing.

p v → f	t ts z → s	tʃ ʒ → ʃ	t ʐ → ʂ	c ɲ → ɕ	k → x	/ _h
b → p	d → t	dʒ → ts	ɖ → t	j → c	g → k	
b f → v	d dz s → z	dʒ ʃ → ʒ	ɖ ʂ → ʐ	j → ɲ	g x → ɣ	/ _ɦ
p → b	t → d	ts → dz	t → ɖ	c → ɟ	k → g	

e.g., 'kohorto' [khõ̃'t] → [xhõ̃t], 'viandhaketafo' [vjæ̃'dhāk'tɔ̃ʒ] → [vjæ̃'thāk'tɔ̃ʒ]

2.8 LOWLANDS: Glottal fricatives deleted after obstruents

e.g., 'kohorto' [xhõ̃'t] → [xõ̃t], 'viandhaketafo' [vjæ̃'thāk'tɔ̃ʒ] → [vjæ̃'tāk'tɔ̃ʒ]

2.9 HIGHLANDS: Obstruent-glottal clusters become ejectives

$$\begin{array}{llll} tʔ dʔ \rightarrow t' & tsʔ dʔ \rightarrow ts' & tʃʔ dʔ \rightarrow tʃ' & sʔ zʔ \rightarrow s' \quad ʃʔ ʒʔ \rightarrow ʃ' \\ tʔ dʔ \rightarrow t' & tsʔ dʔ \rightarrow ts' & sʔ zʔ \rightarrow s' & cʔ ʃʔ \rightarrow c' \quad ʃʔ ʒʔ \rightarrow ʃ' \\ pʔ bʔ \rightarrow p' & fʔ vʔ \rightarrow f' & kʔ gʔ \rightarrow k' & xʔ ɣʔ \rightarrow x' \end{array}$$

e.g., 'kohorto' [khõ't] → [k'õ't]

2.10 Glottal fricatives disappear when they precede consonants and become velar elsewhere

$$\begin{array}{l} h \text{ fi} \rightarrow \emptyset / _C \\ h \text{ fi} \rightarrow x \text{ y} \end{array}$$

2.11 Velars fricatives become palatal when they follow a front vowel

$$x \text{ y} \rightarrow \text{ç ʝ} / \{i, e, y, \emptyset, \text{æ}, \text{æ}\}_-$$

e.g., 'rehejmiği' [refiẽ:'midʒ] → [reyẽ:'midʒ]

2.12 Nasal clusters assimilate to the final nasal in the cluster

e.g., 'enmariğu' [enmwydʒ] → [emmwydʒ]

2.13 Obstruent + [l] clusters change into single obstruents

$$\begin{array}{ll} p_l b_l \rightarrow \phi \quad \beta & f_l s_l ʃ_l \rightarrow \text{ʃ} \\ t_l d_l \rightarrow t \quad d \quad \text{ʒ} & v_l z_l ʒ_l \rightarrow \text{ʒ} \\ k_l g_l \rightarrow k \quad \text{g} & \text{(LOWLANDS)} \\ & \rightarrow x \quad \text{y} \quad \text{(HIGHLANDS)} \end{array}$$

2.14 Vowels become round after [w]

$$i \rightarrow y \quad e \rightarrow \emptyset \quad a \rightarrow \text{ɒ} \quad \text{æ} \rightarrow \text{œ}$$

2.15 Consonant + [w] clusters become single consonants

$$\begin{array}{lll} pw \text{ bw} \text{ mw} \rightarrow w & fw \text{ sw} \rightarrow \phi & vw \text{ zw} \rightarrow \beta \\ \eta w \text{ ɳw} \text{ ɲw} \rightarrow \eta & nw \rightarrow n & kw \text{ gw} \rightarrow x \text{ y} \\ tw \text{ tsw} \text{ tʃw} \text{ tʃw} \text{ cw} \rightarrow k & & \\ dw \text{ dʒw} \text{ dʒw} \text{ dʒw} \text{ ʃw} \rightarrow g & & \end{array}$$

2.16 Obstruent + r clusters change into single obstruents

$$\begin{array}{ll} p_r \text{ f}_r \rightarrow \phi^R & br \text{ vr} \rightarrow \beta^R \\ t_r \text{ dr} \rightarrow t \quad d & k_r \text{ gr} \rightarrow kw \text{ gw} \\ s_r \text{ ʃ}_r \rightarrow s & zr \text{ ʒ}_r \rightarrow z \end{array}$$

^R indicates rhotacization of the next vowel.

2.17 [l] and [r] merge to [l]

2.18 Vowels become rhotic after retroflex consonants

$$V \rightarrow V^r / \{\widehat{t\mathfrak{s}}, \widehat{d\mathfrak{z}}, \mathfrak{s}, \mathfrak{z}, \mathfrak{t}, \mathfrak{d}\}_-$$

2.19 Retroflexes merge with palatoalveolars (or pure alveolars if no palatoalveolar is available)

$$\widehat{t\mathfrak{s}} \widehat{d\mathfrak{z}} \mathfrak{s} \mathfrak{z} \mathfrak{t} \mathfrak{d} \mathfrak{n} \rightarrow \widehat{t\mathfrak{j}} \widehat{d\mathfrak{z}} \mathfrak{j} \mathfrak{z} \mathfrak{t} \mathfrak{d} \mathfrak{n}$$

2.20 LOWLANDS: Palatal stops merge with palatoalveolars

$$c \mathfrak{j} \rightarrow \widehat{t\mathfrak{j}} \widehat{d\mathfrak{z}}$$

2.21 Consonant + [j] clusters become single consonants

$$\begin{array}{lll} p\mathfrak{j} \mathfrak{f}\mathfrak{j} \rightarrow \mathfrak{c} & b\mathfrak{j} \mathfrak{v}\mathfrak{j} \rightarrow \mathfrak{j} & k\mathfrak{j} \mathfrak{g}\mathfrak{j} \rightarrow c \mathfrak{j} \\ t\mathfrak{j} \widehat{t\mathfrak{j}\mathfrak{j}} \rightarrow \widehat{t\mathfrak{j}} & d\mathfrak{j} \widehat{d\mathfrak{z}\mathfrak{j}} \rightarrow \widehat{d\mathfrak{z}} & s\mathfrak{j} \mathfrak{j}\mathfrak{j} \rightarrow \mathfrak{j} \\ z\mathfrak{j} \mathfrak{z}\mathfrak{j} \rightarrow \mathfrak{z} & m\mathfrak{j} \mathfrak{n}\mathfrak{j} \mathfrak{n}\mathfrak{j} \mathfrak{n}\mathfrak{j} \rightarrow \mathfrak{n} & \mathfrak{l}\mathfrak{j} \rightarrow \mathfrak{l}\mathfrak{z} \end{array}$$

2.22 Stop plus nasal clusters that don't cross syllable boundaries become single nasals in the place-of-articulation of the original stop

e.g., 'knabo' [knab] → [ɲab]

2.23 Palatals become velar when not adjacent to a front vowel

2.24 Velars become palatal before or after front vowels

(in Lowlands, this surfaces as palatoalveolar affricates to correspond to the stops)

2.25 Vowels shift to a saner system

$$\begin{array}{l} o \mathfrak{p} \rightarrow \mathfrak{o} \\ \mathfrak{a} \rightarrow e \\ \mathfrak{a} \rightarrow a \end{array}$$

2.26 Labiovelar fricatives merge into labials

$$f \mathfrak{v} \rightarrow \mathfrak{f} \mathfrak{b}$$

2.27 Vowels are backed and rounded before [w]

$$\begin{array}{l} i \mathfrak{y} \rightarrow u \\ e \mathfrak{o} \mathfrak{a} \rightarrow \mathfrak{o} \end{array} / _w$$