

Scott Sadowsky

Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany
& Departamento de Lenguas, Literatura y Comunicación, Universidad de La Frontera, Temuco, Chile
ssadowsky@gmail.com

Héctor Painequeo

Departamento de Lenguas, Literatura y Comunicación, Universidad de La Frontera, Temuco, Chile
hector.painequeo01@gmail.com

Gastón Salamanca

Departamento de Español, Universidad de Concepción, Concepción, Chile
gsalaman@udec.cl

Heriberto Avelino

Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany
heriberto_avelino@eva.mpg.de

Mapudungun (/mɛpɔθɔ'ɲɔn/ or /mɛpɔθɔ'ɲɔn/; also known as ‘Mapudungu’, ‘Mapuzugun’, ‘Mapuche’, ‘Mapuchedungun’, ‘Chedungun’ and ‘Araucanian’ or ‘Araucano’ (the latter two being archaic)) is a language isolate spoken actively by approximately 144,000 people in Chile (Zúñiga 2007), as well as by some 8,400 people in Argentina (Instituto Nacional de Estadísticas y Censos 2005), virtually all of whom are bilingual in Spanish. Its ISO 639–3 code is *arn*.

Mapudungun can be divided into three broad dialect groups: north, central and south. These are further divided into eight sub-groups: I and II (northern group), III–VII (central group) and VIII (southern group). These dialects share a high degree of mutual intelligibility, which decreases only between I and VIII (Croese 1980). The Mapudungun spoken in the Argentinean provinces of Neuquén and Río Negro is similar to that of the central dialect group in Chile, while the Ranquel (Rankülche) variety spoken in the Argentinean province of La Pampa is closer to the northern dialect group (Golluscio 2009).

Mapudungun is not an official language of Chile or Argentina, and has received virtually no government support throughout its history. It is not used as a language of instruction in either country’s educational system (Salas 1992), and no university trains teachers of the language. At present, a small number of schools may impart Mapudungun in optional second-language classes (spoken greetings and phrases only; neither true oral language competency nor literacy are taught) to Mapuche students as part of the Chilean government’s Bilingual Intercultural Education Program (Fernández Droguett 2005). However, the use of this educational strategy

by the program, along with its lack of a language revitalization policy, make its efficacy in furthering the use of Mapudungun highly doubtful.

A multitude of writing systems have been developed for Mapudungun, but none has gained widespread adoption, and the language is rarely written.

Only 2.4% of urban speakers and 15.9% of rural speakers use Mapudungun when speaking with children (Zúñiga 2007), while only 3.8% of speakers aged 10–19 years in the south of Chile (the language's stronghold) are 'highly competent' in the language (Gundermann et al. 2009). These factors, combined with the language's small number of speakers and the strong pressures that they face to abandon the language in favor of Spanish, indicate that Mapudungun's survival cannot be guaranteed unless the current situation changes substantially.

The present description is based on the speech of four female and five male speakers whose ages range from 40 to 62 years (average: 51 years). All are native first-language speakers of Mapudungun who learned Spanish as a second language, starting on average at age 9, and all but two of them remain dominant in Mapudungun. They were born and raised in Isla Huapi, an isolated agricultural settlement of approximately 600 inhabitants located in Chile's 9th Region (Araucanía), and all but one continue to live there.¹ Their dialect belongs to sub-group V. The recordings of the word lists and the 'North Wind' text are of a 56-year-old male speaker, with the exception of seven words containing phenomena not found in his idiolect.² Additional recordings of each speaker's stressed and unstressed allophones of /ə/ have also been provided as supplementary sound files.

The orthographic transcriptions in the present article follow Zúñiga's (2001) proposal, with the addition of <sh> for /ʃ/. It should be noted that the selection of an alphabet to represent Mapudungun is a politically- and emotionally-charged issue that is far from being settled; our choice in this matter reflects what we believe to be the most transparent option for the readers of this Illustration.

Consonants

	Bilabial	Labio-dental	Inter-dental	Alveolar	Post-alveolar	Retroflex	Palatal	Velar
Plosive	p		t̪	t				k
Affricate					tʃ	tʂ		
Nasal	m		ɲ	n			ɲ	ŋ
Fricative		f	θ	s	ʃ	ʂ		ɣ
Approximant							j	
Lateral approximant			l̪	l			ʎ	
Labialized approximant								w

¹ Isla Huapi in Chile's 9th Region (Araucanía) is not to be confused with the Isla Huapi located in Chile's 14th Region (Los Ríos), near the city of Valdivia.

² These words are among those cited as examples throughout the main body of the text. [ˈmɤʃ] was produced by a 56-year-old male speaker; [kɜˈʎɔʃ], [kɜˈθɔʃ], [ˈkɔz̪ɔʃ] and [ˈkɔz̪] were produced by a 53-year-old female speaker; and [ˈmɔnːɜ] and [ˈɲɔʃɔʃ] were produced by a 54-year-old male speaker.

p	po ¹ zɛ *	pura	‘eight’
k	ko ¹ zɛ *	kura	‘stone’
t̪	ʼfət̪ɛ *	füt’a	‘husband’
t̪	ʼfət̪ɛ *	füta	‘elderly person’
tʃ	tʃɛ ¹ fön *	chafon	‘to cough’
tʃ	tʃɛ ¹ fön *	trafon	‘to shatter’
m	mɛ ¹ tʃɪ *	machi	‘healer’
ɲ	ɲɛ ¹ tʃɪ *	ñachi	‘spiced, coagulated blood’
ɲ	mə ¹ ɲɛ *	mün’a	‘male cousin on father’s side’
n	mə ¹ ɲɛ *	müna	‘enough’
ɲ	tʃɛ ¹ ɲɛ *	tranga	‘jaw’
f	ʁo ¹ fu *	lhufu	‘depth (of water)’
θ	ʼθɛɲɛ	dañe	‘nest’
s	ʁɛɲwɛ	sañwe	‘pig’
ʃ	ʁo ¹ ʃu *	lhushu	‘premature’
z	zɛ ¹ ʃɛn	rayen	‘flower’
ɣ	kɛ ¹ ɣəɭ	kagül’	‘phlegm that is spit’
l̪	l̪ɛ	l’a	‘cadaver’
l̪	l̪ɛf	laf	‘spread out on horizontal surface’
ʎ	ʎoθ	lhud	‘used’
j	juθ	yud	‘sharp’
w	tʃɛ ¹ wɛ *	trawa	‘skin’

An asterisk is used in the preceding list to indicate words which were pronounced with stress on the other syllable by some speakers (see ‘Suprasegmental features’, below).

In the variety of Mapudungun that this illustration describes, four pairs of consonants are distinguished by an interdental/alveolar opposition: /t̪-/t/, /l̪-/l/, /θ-/s/ and /ɲ-/n/. With the exception of the voiceless phonemes /θ/ and /s/, these pairs have merged in favor of the alveolars in dialect sub-group I (Salamanca & Quintrileo 2009). In sub-group II, there are conflicting reports: Sánchez (1989) claims that the same merger has occurred, while Salamanca (1997) finds that the distinction is maintained. In other dialects, there is also dispute on this issue, with several authors claiming the distinction is either dying out (Smeets 2007) or has already done so (Moesbach 1962, Croese 1980). In dialects in which the merger has taken place, the interdentals may be present as allophones of the corresponding alveolars (Croese 1980, Salamanca & Quintrileo 2009).

Given the typological rarity of this series of contrasts (Moran 2011) and the controversy that surrounds them, we present a series of palatograms (Figures 1–8) to both confirm their existence and illustrate their precise articulatory nature.³

Varieties of Mapudungun that maintain the interdental–alveolar distinction are notable for having a series of five phonologically-opposed nasals: /m/, /ɲ/, /n/, /ɲ/ and /ŋ/.

Before the front vowels /ɪ/ and /ɛ/, the velars /k/, /ŋ/ and /ɣ/ tend to be fronted to [c], [ŋ], and [ɣ] or [j], respectively (e.g. /k̪ɛ¹tʃu/ ‘five’ > [c^hɛ¹tʃu]). The voiceless plosive /k/ is often aspirated, giving [k^h] (/k̪o¹tʃɛn/ ‘to wring out’ > [k^hɪ¹tʃɛn]). Aspiration also occurs fairly frequently with [c] (see [c^hɛ¹tʃu], above), /t/ (/ʼfət̪ɛ/ ‘elderly person’ > [ʼfət̪ɛ^h]), and occasionally with /p/ and /t/. In all cases, the aspiration is more lenis than that which is produced in English, for example.

³ The PHOIBLE database (<http://phoible.org/>), which at the time of consultation contained the segment inventories of 1065 distinct languages, indicates that the /t̪-/t/ opposition exists in 4.3% of the world’s languages, /ɲ-/n/ in 1.9%, /θ-/s/ in 3.7%, and /l̪-/l/ in 0.9%. Mapudungun is the only language known to have all four of these pairs.

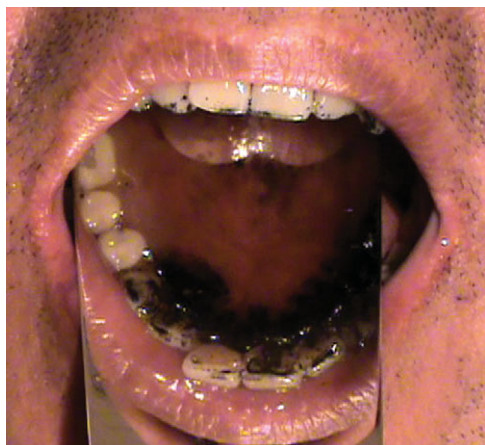


Figure 1 (Colour online) Plosive /t/. Palatogram of /fə'tɛ/ 'husband'. Note the stain on the biting and outer surfaces of the upper teeth, indicating interdental contact.



Figure 2 (Colour online) Plosive /t/. Palatogram of /fə'tɛ/ 'elderly person'.

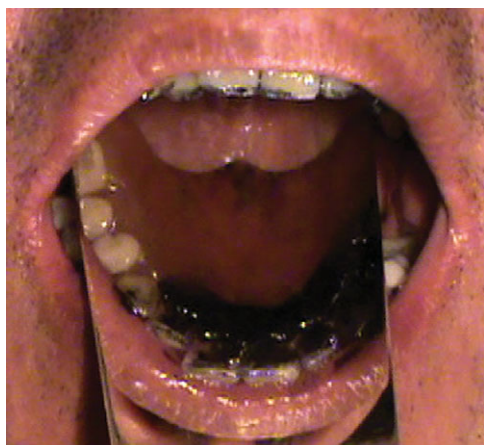


Figure 3 (Colour online) Nasal /ŋ/. Palatogram of /mə'ŋɛ/ 'male cousin on father's side'. Note the stain on the biting and outer surfaces of the upper teeth, indicating interdental contact.



Figure 4 (Colour online) Nasal /n/. Palatogram of /mə'nɛ/ 'enough'.

The voiced retroflex continuant /z/ can be realized as either a fricative [z] or an approximant [ɹ] in all positions; we have opted to classify it as the former (against the traditional interpretation) as this is the predominant variant in our sample. Palatographic evidence (not shown) indicates that /z/ is apical rather than sub-apical. In post-nuclear position, /z/ may be devoiced to [s̥] (/t̥s̥u'kuz/ 'fog' > [t̥s̥u'ku̥s̥]). In three of the nine speakers in our sample, /z/ is most frequently a retroflex lateral [ɹ] (/mɛzɛ/ 'hare' > [mɛɹɛ]).



Figure 5 (Colour online) Fricative /θ/. Palatogram of /θɪf/ 'rope'. Note the stain on the biting and outer surfaces of the upper teeth, indicating interdental contact.



Figure 6 (Colour online) Fricative /s/. Palatogram of /sɪpʊ/ 'jewelry used by women'.

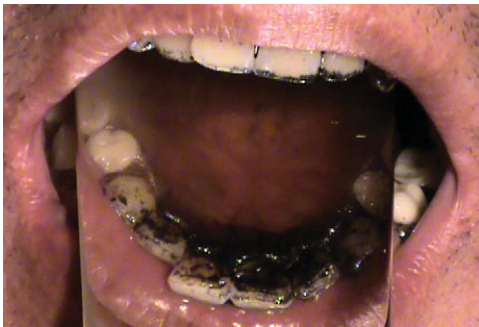


Figure 7 (Colour online) Lateral approximant /ɪ/. Palatogram of /ɪ/ 'cadaver'. Note the stain on the biting and outer surfaces of the upper teeth, indicating interdental contact.



Figure 8 (Colour online) Lateral approximant /ɪ/. Palatogram of /ɪf/ 'spread out on horizontal surface'.

In some speakers, the retroflex affricate /t͡ʂ/ has allophones that may be described as an apical post-alveolar affricate [t͡ʂ] and an aspirated apical post-alveolar plosive [t͡ʂʰ].⁴

Contrary to reports in the literature, the phonemes /n/ and /l/ do not have retroflex allophones ([ɲ] and [ɭ]) when in the presence of the retroflex phonemes /z/ and /t͡ʂ/, but remain alveolar (/wɪt͡ʂɔn/ 'visitor' > [wɪt͡ʂɔn]; /kə't͡ʂɔl/ 'fire' > [kɨ't͡ʂɔl]).

The approximant /j/ may be realized as the fricative [j] (/kɔjʊ/ 'six' > [kɔ'jʊ]).

In utterance-final position, /l/ and /l/ may be devoiced to [ɬ] and [ɬ], respectively (/kɔ'vɔl/ 'phlegm that is spit' > [kɔ'vɔɬ]; /kɔ'ɔl/ 'a different song' > [kɔ'ɔɬ]).

In emphatic speech, the nasals /m/, /n/ and /ɲ/, as well as the laterals /l/ and /ɭ/, may be lengthened to up to triple the duration of non-lengthened tokens (e.g. /'mɔnɔ/ 'enough' > ['mɔn:ɔ]) when in pre-nuclear position in a word-final syllable, giving the impression of a geminate. However, this phenomenon gives rise to no phonological oppositions.

⁴ The use of the underdot follows the convention adopted by Ladefoged & Maddieson (1996).

Dialectal differences

In dialect sub-groups III and IV the fricative phonemes /f/ and /θ/, which are predominantly voiceless in sub-groups V–VIII, have voiced allophones ([v β] and [ð], respectively) in free variation with the voiceless allophones [f φ] and [θ] (Echeverría & Contreras 1965; Salas 1976; Lagos 1981, 1984; Álvarez-Santullano 1986). In sub-groups I and II, the voiced allophones predominate to the extent that the labiodental and interdental fricative phonemes are /v/ and /ð/ instead of /f/ and /θ/ (Salamanca 1997, Salamanca & Quintrileo 2009). This phenomenon has also been observed in the Ranquel variety (Golluscio 2009).

The phoneme /ʃ/ occurs with certainty in sub-group V, and was suggested for IV by Suárez (1959) using data from Lenz (1895). In the Alto Bío-Bío region of II, neither /ʃ/ nor [ʃ] exists (Sánchez 1989, Salamanca 1997); cognate words in this dialect have /s/ instead. In the Tirúa region of I (Salamanca & Quintrileo 2009) and in sub-group IV (Echeverría 1964), [ʃ] exists as an allophone of /tʃ/. In III, [ʃ] is an allophone of /s/ (Salas 1976). It should be noted that in some cases, the differences in the status of /ʃ/ and [ʃ] may be due to authors' differing interpretations of what constitutes a phoneme, rather than to actual dialectal differences.

Vowels

Mapudungun has six vowel phonemes, /ɪ ɛ ɐ ɔ ʊ ə/, all of which have more close allophones in unstressed position, [ɪ̣ ɛ̣ ɐ̣ ɔ̣ ʊ̣ ə̣], as per the instrumental analysis described below. It should be noted that the vowels of Mapudungun have traditionally been treated as the five vowels of Spanish (/i e a o u/), with identical stressed and unstressed allophones, plus a high central unrounded vowel /i/ (commonly known as the 'sixth vowel') having a mid central allophone [ə] in unstressed position (Echeverría & Contreras 1965).

For the present description, an instrumental analysis was performed on 871 vowel tokens produced by nine speakers (four female, five male). The results of the analysis are shown as a standard vowel trapezoid in Figure 9, and as an F1 versus F2 plot in Figure 10. Values were normalized using the Nearey 1 formula (Nearey 1977) and scaled to Hz. The selection of vowel symbols was based on Lindblom's (1986) quasi-cardinal vowels as modified by Iivonen (1994).

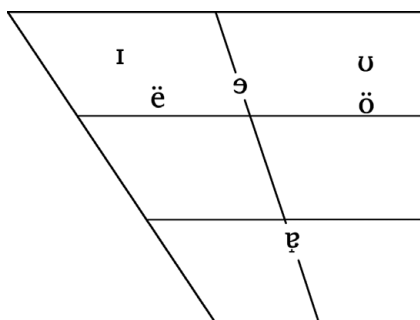


Figure 9 Vowel chart of Mapudungun.

ɪ	pɪn	pin	'to say'
ɛ	pɛn	pen	'to see'
ɐ	'kɐzɐ	karü	'green'
ö	'közɐ	korü	'soup'
ʊ	ɛ'lʊn	elun	'to give'
ə	ɛ'lən	elün	'to leave (something)'

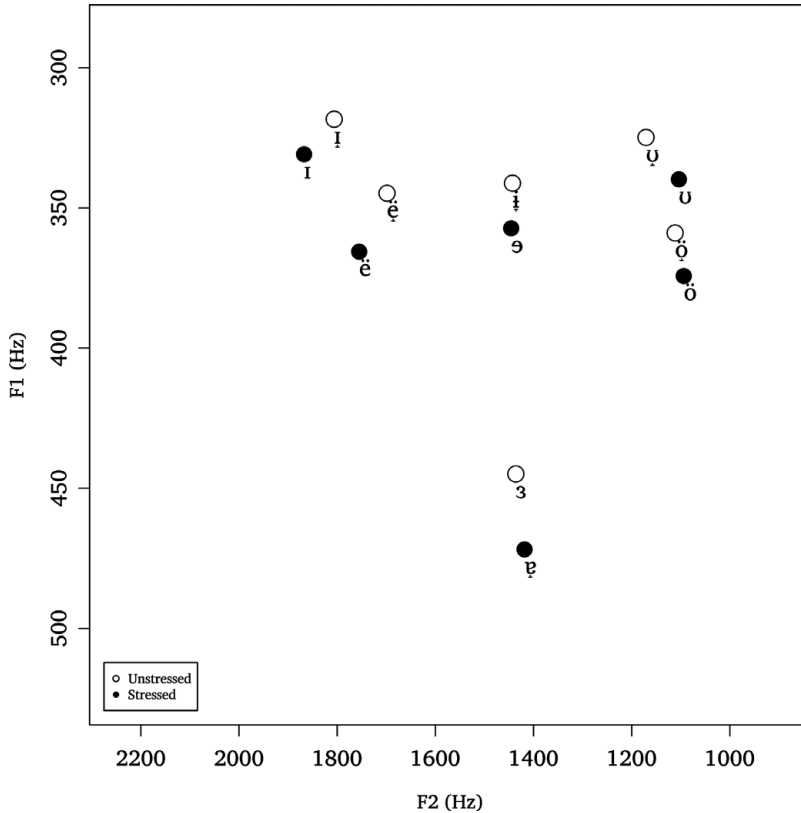


Figure 10 Plot of F1 versus F2 for average values of 871 stressed (black circles) and unstressed (white circles) vowel tokens produced by 4 female and 5 male speakers. Values were normalized using the Nearey 1 formula and scaled to Hz.

As the instrumental analysis reverses the traditional interpretation of the stressed ([ɔ̃] instead of [ɪ]) and unstressed ([ɪ] instead of [ə]) allophones of Mapudungun’s sixth vowel, we provide their unnormalized mean F1 values for each speaker in Table 1.

Table 1 Unnormalized mean F1 values (in Hz) of stressed and unstressed tokens of /ə/.

Speaker	Stressed /ə/: [ɔ̃]	Unstressed /ə/: [ɪ]
F1	428	372
F2	548	451
F3	399	332
F4	429	354
M1	453	357
M2	334	317
M3	368	246
M4	386	280
M5	473	385

Fully 10 of Mapudungun’s 12 vowel allophones are concentrated in the high vowel space, while the remaining two fall in the mid-low area (Figure 10). Furthermore, the entire vowel space used by the language is a mid-centralized subset of the available space. Even when

taking into account 1 standard deviation of dispersion, the Hz-scaled normalized average F1 values of Mapudungun vowels are limited to a range of approximately 325–575 Hz, while F2 falls between 1000 Hz and 2050 Hz. Yet in spite of this compact spacing, there is little overlap between vowels, especially stressed ones. This vowel distribution pattern does not seem to accord with the typologically prevalent one of maximum dispersion (Disner 1984).

Conventions

Unstressed vowels are generally devoiced, and often elided, in utterance-final position when following voiceless consonants (/ˈnɛtʃi/ ‘spiced, coagulated blood’ > [ˈnɛtʃ̥i] or [nɛtʃ̥]). Somewhat less frequently, utterance-final vowels may also undergo devoicing or elision after voiced consonants (/ˈkɔzə/ ‘soup’ > [ˈkɔz̥i] or [kɔz̥]).

In word-medial position, /ə/ may be elided when it occurs in the syllable following the stressed one (/ˈkɛnpələ/ ‘a different place’ > [ˈkɛnpələ]), and it may be devoiced in the syllable preceding the stressed one when following a voiceless consonant (/kəˈtʃəŋ/ ‘tied, bundled’ > [k̥iˈtʃəŋ]).

Suprasegmental features

Stress in Mapudungun is non-contrastive. In general, closed syllables tend to attract stress. Words ending in a consonant are stressed on the final syllable ([mɛˈkɔŋ] ‘cape, poncho’). Disyllabic words ending in a vowel tend to be stressed on the final syllable in northern and north-central dialects ([pɔˈŋi] ‘potato’), and on the penultimate syllable in southern and south-central dialects ([ˈpɔŋi] ‘potato’). If the first syllable is closed and the second open, stress falls on the first ([ˈwɛntʃu] ‘man’). If both syllables are closed, stress tends to fall on the final one ([ɪnˈtʃɪn] ‘we (plural)’) (Zúñiga 2006). There may also be some degree of idiolectal variation in the assignment of stress.

In trisyllabic words, stress tends to fall on the penult if the word ends with an open syllable ([mɛˈwɪθɛ] ‘hill, mountain’), and on the final syllable otherwise ([mɛtʃ̥iˈtɔŋ] ‘Mapuche healing ceremony’).

In words of four or more syllables, primary stress is assigned in accordance with the rules detailed above for disyllabic words, as applied to the last two syllables of the polysyllabic word. Additionally, words of four or more syllables receive a secondary stress accent on the first or second syllable from the left. If one of the first two syllables is closed, it receives the secondary stress ([ˌnɛntɪmɛˈlɛl] ‘sunny terrain’; [ɜθəmˈtʃɛfɛ] ‘person who teaches’). If both syllables are open, secondary stress falls on the first syllable ([ˌtʃɛz̥iˈlɔŋkɔ] ‘headband’), while if both are closed, it falls on the second syllable ([tʃɛˌɜlˌkɛnˈwɛnɔ] ‘thunderous skies’).

The maximum syllable structure in Mapudungun is CVC. In pre-nuclear position, all consonants may occur; in post-nuclear position, all but plosives and affricates may occur. Mapudungun is a non-tonal language.

Transcription

Broad

pr̥iku kəˈzɔf ɛˈŋu ɛŋˈtə || pr̥iku kəˈzɔf ɛˈŋu ɛŋˈtə | ɲoˈtukɛwˈmɛkɛˈlu | tuˈtʃiɲi ˈθɔj
 nɛwɛnˈhɛn | zɔˈpɛzɔˈmi ˈkɪɲɛ wɛnˈtʃu mɛˈkɔntulɛˈlu fɛj ˈmɛw fɛjˈpɪwɪˈŋu ||
 tuˈtʃiɲi nɛnˈtuɲmɛfɪˈlɛ ɲi mɛˈkɔŋ ˈfɛjtɪtʃi wɛnˈtʃu | fɛj ˈθɔj nɛwɛnɲɛzˈkɛj pr̥ɪɲɛj
 || fɛj ˈmɛw | fəˈtʃɔ nɛˈwɛntu ˈtʃɪpɛj | tɪ pr̥iku kəˈzɔf || wɛˈlu | ˈtɪjɛtʃi wɛnˈtʃu
 fɛj | ˈθɔj ɛmpɔˈɮuˈwi ɲi mɛˈkɔŋ mɛw || fɛmˈlu tɪ wɛnˈtʃu fɛj | tɪ pr̥iku kəˈzɔf
 zɔˈpɛj || fɛj ˈmɛw tɪ ɛŋˈtə | wɛlɔˈfɛj ɲi ɲˌlɔf ˈtʃɪpɛn || ɛzɛˈlu tɪ wɛnˈtʃu | nɛnˈtuɲ
 ɲi mɛˈkɔŋ || fɛj ˈmɛw | tɪ pr̥iku kəˈzɔf || kɪˈmi | ɛŋˈtə ɲi ˈθɔj nɛwɛnˈhɛn

Narrow

pi'k^hu k^hə'zəf əḑ'ŋũ ʔn'tɛ^h || pi'k^hu k^hə'zəf əḑ'ŋũ ʔn'tɛ^h | n̄ö't^huk^hɔ^hw^hm̄ic^he'lu:
 | t^hɔ^htʃi ni 'θəj n̄ew̄en'ŋen | ɔ^hpɔ^hɔ^hm̄i 'c^hɔ^hni w̄enn̄o^hʃu: m̄ɔ^hkɔ^hnt̄il̄e'lu || f̄ej
 'm̄ew f^wɛj^hp^hɛ^ww̄e'ŋu || t^hɔ^htʃi: n̄en^ht^hi^wm̄ɔ^hf̄e'le ni m̄ɔ^hkɔ^hni: 'f̄ej^ht^hi^ht̄j̄e w̄en^hʃu |
 f̄ej | 'θ̄öj ne^hw̄enn̄e^hcij p̄e^hej || f̄ej 'm̄ew | fi^ht^he n̄e'w̄ent^hi^hʃu^hp̄əj | ti pi'ku^h ɔ^h'zəf
 || w̄e'lu | t^hɔ^htʃi w̄en^hʃu f̄ej | 'θ̄öj ɛ^hmp^wɔ^hwi ni 'm̄ək^wɔ^hni 'm̄ew || f̄em^hl̄ə t^hi
 w̄en^hʃu: f̄e:ɛ | t^hi pi'ku^h k̄ɔ^h'zəf: z̄u^hp̄əj || f̄ej 'm̄ew t^hi ɛ^hn'tɛ^h | w̄i^hl̄əf^wɔ^h ni ɛ^hl̄əf
 t^he'p̄əj || ɛ^hz̄el̄ə t^hi w̄en^hʃu | n̄en^ht^wɛj^h ni m̄ɔ^hkɔ^hni || f̄ej 'm̄ew | t^hi pi'ku^h k̄ɔ^h'zəf:
 || ki'm̄i | ʔn't^he ni 'θ̄əj n̄ew̄en'ŋen

Orthographic

Piku küruf engu antü

Piku küruf engu antü n'otukawmekelu tuchi ñi doy newengen, ruparumi kiñe wentrü makuñtulelu. Fey mew feypiwingu: tuchi nentuñmafile ñi makuñ feytichi wentrü fey doy newenngerkey pinngey. Fey mew fütra newentu tripay ti piku küruf; welu tiyechi wentrü fey doy ümpülhuwi ñi makuñ mew. Femlu ti wentrü fey ti piku küruf rupay. Fey mew ti antü wülüfüy ñi alof tripan. Arelu ti wentrü, nentuy ñi makuñ. Fey mew ti piku küruf kimi antü ñi doy newengen.

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References

- Álvarez-Santullano, Pilar. 1986. Descripción fonológica del huilliche, un dialecto del mapuche o araucano del centro-sur de Chile. M.A. thesis, Universidad de Concepción, Chile.
- Croese, Robert. 1980. Estudio dialectológico del mapuche. *Estudios filológicos* 15, 7–38.
- Disner, Sandra Ferrari. 1984. Insights on vowel spacing: Results of a language survey. In Ian Maddieson (ed.), *Patterns of sounds*, 136–155. Cambridge: Cambridge University Press.
- Echeverría, Max S. 1964. Descripción fonológica del mapuche actual. *Boletín del Instituto de Filología de la Universidad de Chile* XVI, 13–59.
- Echeverría, Max S. & Heles Contreras. 1965. Araucanian phonemics. *International Journal of American Linguistics* 31, 132–135.
- Fernández Droguett, Francisca. 2005. El currículum en la educación intercultural bilingüe: algunas reflexiones acerca de la diversidad cultural en la educación. *Cuadernos interculturales* 3.
- Golluscio, Lucía. 2009. Loanwords in Mapudungun, a language of Chile and Argentina. In Martin Haspelmath & Uri Tadmor (eds.), *Loanwords in the world's languages: A comparative handbook*, 1035–1071. Berlin: De Gruyter Mouton.
- Gundermann, Hans, Jaqueline Canihuan, Alejandro Clavería & César Faúndez. 2009. Permanencia y desplazamiento, hipótesis acerca de la vitalidad del mapuzugun. *Revista de lingüística teórica y aplicada* 47, 37–60.
- Iivonen, Antti. 1994. A psychoacoustical explanation for the number of major IPA vowels. *Journal of the International Phonetic Association* 24, 73–90.
- Instituto Nacional de Estadísticas y Censos. 2005. *Cuadro 3.2: Población mapuche indígena de 5 años o más por grupos de edad según manejo de lenguas indígenas. Total país. Años 2004–2005. Encuesta Complementaria de Pueblos Indígenas (ECPI) 2004–2005*. Buenos Aires: Instituto Nacional

- de Estadísticas y Censos. <http://www.indec.mecon.ar/webcenso/ECPI/pueblos/Datos/0700c0302.xls> (accessed 26 November 2012).
- Ladefoged, Peter & Ian Maddieson. 1996. *The sounds of the world's languages*. Oxford & Malden, MA: Blackwell.
- Lagos, Daniel. 1981. El estrato fónico del mapudungu(n). *Nueva Revista del Pacífico* 19–20, 42–66.
- Lagos, Daniel. 1984. Fonología del mapuche hablado en Victoria. *Actas*, 41–50. Temuco, Chile: Universidad de la Frontera e Instituto Lingüístico de Verano.
- Lenz, Rodolfo. 1895. Estudios araucanos. *Anales de la Universidad de Chile* XC–XCVIII.
- Lindblom, Björn. 1986. Phonetic universals in vowel systems. In John J. Ohala & Jeri J. Jaeger (eds.), *Experimental phonology*, 13–44. Orlando, FL: Academic Press.
- Moesbach, Ernesto Wilhelm de. 1962. *Idioma mapuche, dilucidado y descrito con aprovechamiento de la Gramática Araucana de Padre Félix José de Augusta*. Padre Las Casas: Imprenta San Francisco.
- Moran, Steven. 2011. *Phonetics Information Base and Lexicon (PHOIBLE)*. Ph.D. dissertation, University of Washington. [<http://phoible.org/>]
- Nearey, Terrance M. 1977. *Phonetic feature systems for vowels*. Ph.D. dissertation, University of Alberta. [Reprinted 1978, the Indiana University Linguistics Club.]
- Salamanca, Gastón. 1997. Fonología del pehuenche hablado en el Alto Bío-Bío. *Revista de lingüística teórica y aplicada* 35, 113–124.
- Salamanca, Gastón & Elizabeth Quintrileo. 2009. El mapuche hablado en Tirúa: fonemas segmentales, fonotaxis y comparación con otras variedades. *Revista de lingüística teórica y aplicada* 47, 13–35.
- Salas, Adalberto. 1976. Esbozo fonológico del mapudungu, lengua de los mapuche o araucanos de Chile central. *Estudios filológicos* 11, 143–153.
- Salas, Adalberto. 1992. *El mapuche o araucano. Fonología, gramática y antología de cuentos*. Madrid: Mapfre.
- Sánchez, Gilberto. 1989. Relatos orales en pewenche chileno. *Anales de la Universidad de Chile. Estudios en honor de Yolando Pino Saavedra* (5a serie), 289–360.
- Smeets, Ineke. 2007. *A grammar of Mapuche* (Mouton Grammar Library 41). Berlin: Mouton de Gruyter.
- Suárez, Jorge A. 1959. The phonemes of an Araucanian dialect. *International Journal of American Linguistics* 25, 177–181.
- Zúñiga, Fernando. 2001. Escribir en mapudungun. Una nueva propuesta. *Onomázein* 6, 263–279.
- Zúñiga, Fernando. 2006. *Mapudungun, el habla mapuche*. Santiago, Chile: Centro de Estudios Públicos.
- Zúñiga, Fernando. 2007. Mapudunguwelaymi am? '¿Acaso ya no hablas mapudungun?'. Acerca del estado actual de la lengua mapuche. *Estudios públicos* 105, 9–24.