Journal of Linguistics (2025), 1–43
doi:10.1017/S002222672500012X

Journal of Linguistics CAMBRIDGE UNIVERSITY PRESS

RESEARCH ARTICLE

Affective coronal alternations in Mapudungun: Sound symbolism, change, and morpho-phonological structure

Benjamin Molineaux

The University of Edinburgh, Dugald Stewart Building, 3 Charles St., Edinburgh EH8 9AD, Scotland, UK
Email: benjamin.molineaux@ed.ac.uk

Received: 25 September 2023; **Revised:** 05 January 2025; **Accepted:** 22 January 2025

Keywords: augmentatives; dentalisation; diminutives; iconicity; Mapudungun; palatalisation; sound symbolism

Abstract

This paper examines a series of consonantal alternations conveying 'affective' meanings in the South American language Mapudungun (Catrileo 1986, 2010, 2022). The processes target the rich four-place coronal inventory of the language by shifting consonants in root morphemes to palatal or dental articulations. The palatalisations are cross-linguistically common in implying small size, tenderness, closeness, and politeness (e.g. [nazˌki] 'cat' [ɲaʃki] 'kitty'); however, the effects of dentalisation are more unexpected, implying distance, abruptness, sarcasm, and rudeness (e.g. [nazˌki] 'cat' [n̪aθki] 'damned cat'). While speakers evidently seem to assign sound symbolic value to the alternations, the patterns do not align neatly with cross-linguistically expected 'synaesthetic' correspondences, particularly to do with size symbolism and acoustic frequency (Ohala 1984, 1994). Based on historical metalinguistic commentary and corpus data, I argue that the Mapudungun alternations are long-established in the language, showing a variety of lexicalised forms, and being deeply grammatically entrenched both in their semantico-pragmatic implications and their morpho-phonological structure. As such, any sound-symbolic patterns are fundamentally subordinate to the grammatical architecture. I propose that a more parsimonious analysis of the patterns is an autosegmental one, where floating evaluative morphemes (diminutives and augmentatives) spread [DISTRIBUTED] and [ANTERIOR] feature nodes to the target coronal consonants, along with their language-specific pragmatics.

1. Introduction

Sound symbolism, as a series of 'systematic associations between sounds and meanings' (Kawahara 2020: 2), encompasses a multiplicity of phenomena ranging from the imitative to the shape-representational to the emotionally evocative. These have a basis in ICONICITY, that is, in 'the resemblance-based mapping between aspects of form and meaning' (Dingemanse et al. 2015: 604). However, the degree of integration of these iconic elements of speech into the grammatical system varies widely. Indeed, in some languages, sound symbolism is

limited to a subset of explicitly imitative or onomatopoetic words or to a skew in the lexical frequency of certain sounds in lexical categories. In other languages, however, sound symbolism may be more deeply integrated into the grammar, being a prominent part of the evaluative morphology (e.g. iconic diminutives and augmentatives in Fungwa, cf. Akinbo 2021) or constituting larger word categories (e.g. West-African ideophones, cf. Dingemanse 2023). The nature of these interfaces between iconicity and grammar is, furthermore, of some importance to linguistic theory, as it straddles the fundamental question of limitations on arbitrariness in linguistic forms. It is also an interesting question for historical (and evolutionary) linguists, as it suggests a diachronic pathway from purely iconic sounds into abstract units integrated into grammatical systems (Cuskley & Kirby 2013).

Here our focus is on Mapudungun (ARN, isolate, Chile/Argentina) a language reported to have consonantal alternations that are driven by 'affective' or 'stylistic' factors, which seem to belie sound-symbolic origins. The most explicit account of the phenomenon relates to alternations among coronal consonants, as described by linguist and native Mapudungun speaker María Catrileo (1986, 2010, 2022). According to this work, 'the expression of affective values in Mapudungun takes place via sound alternations, while in other languages, like Spanish, they are predominantly effected through morpho-syntactic resources' (1986: 12).[1]

In Catrileo's work (and elsewhere, see Sections 2 and 3), we find that, where a coronal consonant shows an alternant that is palatal, this has a diminutive meaning, most often with a positive or endearing connotation, as in (1a, b). This link between palatals (or high vowels) and diminution/positive affect is well attested cross-linguistically (Sapir 1915, 1929; Nichols 1971; Alderete & Kochetov 2017) and tends to be linked to sound symbolic processes (in particular to Ohala's [1984, 1994] so-called 'Frequency Code'; see Section 5). More typologically unexpected is the opposite trend, where Mapudungun coronal consonants may be dentalised, such that the dental alternant gains an augmentative meaning, which most often carries with it a rude or pejorative connotation, as in (1c, d).[2]

(1) a. [**l**amŋe**n**] → [**ʎ**amŋe**ɲ**]
'sister' '(lovely) little sister'
b. [**n**az̨ki] → [**ɲ**a**ʃ**ki]
'cat' '(lovely) kitty'
c. [**l**amŋe**n**] → [**l̪**amŋe**n̪**]
'sister' '(horrible/damned) sister'
d. [**n**az̨ki] → [**n̪**a**θ**ki]
'cat' '(horrible/damned) cat'

In this paper, I examine the pattern of 'affective alternations' found in contemporary Mapudungun as well as its attestation in the 400-year textual record for the language. Throughout, I survey metalinguistic commentary as well as corpus data (see Section 3, for

[1] 'la expresión de valores de tipo afectivo, en mapudungun, se realiza mediante la fluctuación de sonidos, mientras que en otras lenguas, como el español por ejemplo, se efectúan predominantemente con recursos morfosintácticos.' Note: throughout, translations from Spanish, French, and Latin are my own.

[2] For the purposes of the alternations studied in this paper, we take post-alveolars [ʃ] and [t͡ʃ] to fall into the same category as 'true' palatals [ʎ], [ɲ] and [j]. It is also evident that the affricate [t͡ʃ] represents the palatal counterpart of the coronal stops and the retroflex affricate [ʈʂ].

https://doi.org/10.1017/S002222672500012X Published online by Cambridge University Press

details), taking a 'shared reading' approach.[3] This entails the examination of key material in collaboration with Central Mapudungun speaker and traditional educator (*Kimelfe*) Fresia Loncon Antileo, who has provided guidance and intuitions throughout. On this basis, I go on to propose a diachronic trajectory for the phenomenon, arguing that the evidence points to the longstanding productivity of the alternations, alongside a pattern of occasional lexicalisation and morphologisation into the present-day language. I further consider the theoretical status of the alternations both in terms of featural geometry and morphological representations. I suggest that the alternation is best characterised as the result of floating evaluative morphemes (cf. Akinbo 2021, among others) that share the active feature [DISTRIBUTED] and are internally distinguished by the feature [ANTERIOR], highlighting their positive or negative polarity. I argue that while the diminutive/affective forms show a clear sound-symbolic pattern (in line with the 'Frequency Code'), the augmentative/pejorative can only be said to do so in a narrow, highly phonologically and morphologically entrenched sense.

2. Mapudungun 'stylistic/expressive' consonant alternations

Mapudungun has a long descriptive tradition highlighting apparently 'unconditioned' phonological alternations (see Section 3 for details). Indeed, a number of researchers (Key 1976, 1979; Key & Clairis 1976; Martinet 1983, Clairis 1991; Salas 1992; Zúñiga 2006) characterise this as 'phoneme fluctuation', that is 'the possibility of freely alternating two or more phonemes within the same unit of meaning, under the same circumstances, though only in certain lexical items' (Clairis 1991: 19).[4] Nevertheless, at least for a subset of the alluded alternations – the coronal consonants – there is now wider consensus that these convey an 'affective value' (Salas 1992; Zúñiga 2006; Hernández, Ramos & Huenchulaf 2006; Cañumil 2011), directly contradicting the idea that they are context-independent. Indeed, we will argue that these alternations are semantically and pragmatically governed and may even be modelled as morphological processes (see Section 6.2).

In this subsection, we provide some background on the language and its speakers (Section 2.1) and then move on to survey the system of coronal consonants in the language (Section 2.2). This done, we provide a meta-analysis of the literature on the present-day patterns of dentalisation and palatalisation which are claimed to trigger Mapudungun speakers' 'affective' readings of words and utterances (Section 2.3).

2.1. The language and its speakers

Mapudungun (ARN, mapu1245) is the endangered, heritage language of the Mapuche people, with their traditional homeland in the Southern Cone; what is today south-central Chile and Argentina. At the time of first contact with the Spanish Empire (1536), an estimated 1 million people would have spoken the language, mostly to the west of the Andes (Bengoa 2000: 14). Today, optimistic estimates place the number of speakers at around 200,000 (Zúñiga & Olate

[3] For a more detailed account of 'shared reading' as a method for exploring historical linguistic materials for minoritised languages, see Molineaux & Loncon (2024).

[4] 'la positilité pour la même locuteur, dans les mêmes circonstances, de faire alterner librement deux ou plus de deux phonèmes dans la même unité significative, et cela seulement pour certaines unités du lexique.' See Molineaux (2025) for a more in-depth critique of the concept.

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Table 1. Central Mapudungun consonant inventory, based on Sadowsky et al. (2013)

	Labial	Dental	Alveolar	Retroflex	Postalveolar/Palatal	Velar
Stop/affricate	p	t̪	t	t͡ʂ	t͡ʃ	k
Fricative	f	θ	s	ʐ	ʃ	
Nasal	m	n̪	n		ɲ	ŋ
Lateral		l̪	l		ʎ	
Approximant	w				j	ɯ

2017) in Chile and 8,400 in Argentina (INEC 2005), with varying degrees of competence. Transmission, furthermore, is in steep decline (Gundermann et al. 2011) with only weak support available through formal education (Loncon 2017).

While database sources like Ethnologue (Eberhard, Simons & Fennig 2024) and Glottolog (Hammarström et al. 2024) tend to treat Mapudungun as part of a small language family ('Mapudungu' and 'Araucanian', respectively), most specialists regard the language as an isolate (cf. Adelaar & Pache 2023). The proposed sister language for Mapudugnun, Huilliche, may be better conceived of as a moribund dialect, with most differences resulting from advanced attrition (Sadowsky et al. 2015). For the region, the language is well documented, with sources beginning in the colonial period and a number of recent grammars and specialist papers available on various aspects of its linguistic structure. In such works, the language may also be termed Mapuche, Chedungun, or Araucanian, the latter now a rejected exonym.

2.2. Coronal consonants in Mapudungun

The consonantal inventory of Mapudungun displays a wide range of place contrasts among coronals. In Table 1, we see the repertoire for one of the more vital varieties: the Lafkenche dialect of Central Mapudungun.[5]

It is worth noting that the typologically uncommon dental-alveolar contrast of Mapudungun[6] is well established in vital dialects today and in the historical record (Molineaux 2022). Alveolar and dental places of articulation also have different gestures associated to the active articulator, with the former being apical and the latter, laminal, such that these are often characterised as *inter*-dental. The contrast can be instantiated, furthermore, in a small number of minimal and near-minimal pairs, as seen in Table 2.[7]

Overall, the place contrasts among Mapudungun coronals are fairly symmetrical (or 'economic' in the sense of Clements 2003), with matching manners of articulation for most places. The main exception are retroflexes, where nasal and lateral phones show up only as allophones assimilating to other retroflex consonants (Echeverría 1964, but see

[5] Contra Sadowsky et al. (2013), here I have conflated postalveolar and palatal places of articulation. I also treat /ɯ/ as a glide rather than as the fricative /ɣ/, which it is often realised as.

[6] At the time of consultation, among the 2,100 languages in the PHOIBLE database (Moran & McCloy 2019), only 8.9% of languages contrasted dentals and alveolars among stops, 7.8% among nasals, 4.1% among laterals, and 2.9% among fricatives.

[7] For fricatives, only near-minimal pairs may be found, since the alveolar sibilant (/s/) is mostly restricted to borrowings from Spanish and Quechuan.

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Table 2. (Near-)minimal dental-alveolar pairs (from Painequeo, Salamanca & Jiménez 2018 and Augusta 1916)

Stops	Nasals	Laterals	Fricatives
[t̪ən] 'head louse'	[pun̪] 'night'	[ki.l̪a] 'bamboo'	[**θ**a.kel] 'pact/agreement'
[**t**ən] 'high sound'	[pu**n**] 'I arrived'	[ki.**l**a] 'three'	[**s**a.ku] 'sack'(<Spa.'saco')

Table 3. Likely etymological sources for lexicalised /ʃ/ words

Word	gloss	Etymon	gloss
we**ʃ**-we**ʃ**	'crazy/naughty'	we**ʐ**a	'bad'
a**ʅ**u**ʃ**	'(nice and) warm'	a**ʅ**u**θ**	'warm'
a**ʐ**o**ʃ**	'rice'	aro**s**	'rice' (Spanish)
ufi**ʃ**a	'sheep'	oβe**ʃ**a	'sheep'(Colonial Spanish)
mi**ʃ**ki	'honey/sweet'	mi**s**k'i	'honey/sweet' (Southern Quechua)

Sadowsky et al. 2013). Among fricatives, /s/ is a fairly rare. A recent newcomer to the language, it appears mostly in borrowings from Spanish and Quechuan (see Molineaux 2022 for an overview), often in alternation with /θ/, /ʐ/, /tʃ/ or /ʃ/, as exemplified in (2).

(2) a. /laθu/ < Sp. /laso/ 'rope'
b. /tʃumpiru/ < Sp. /sombɾeɾo/ 'hat'
c. /iʐpaθa/ < Sp. /espaða/ 'sword'
d. /manʃu/ < Sp. /manso/ 'tame'

The phonemic status of [ʃ] is also somewhat problematic, since it tends to appear either in place of borrowed /s/ or as a variant of /θ/ or /ʐ/, with a positive affect associated to it. Given that in a number of words speakers perceive /ʃ/ as underived, despite likely having a non- /ʃ/ etymon (see Table 3), we consider it to be part of the phonemic inventory.[8]

2.3. Coronal alternations in Mapudungun

Catrileo's (1986, 2010) key insight regarding 'stylistic' variation in Mapudungun is that, by replacing one segment with another, speakers make direct links between their language and the extralinguistic context. These kinds of shifts disrupt expectations, producing clear pragmatic effects: 'a position of linguistic politeness can be marked as emotional, contemptuous or sarcastic when it is pronounced in a manner that differs from the usually accepted patterns for the occasion' (2010: 51). Key examples for her Central Mapudungun dialect are provided in Table 4, focusing on words with 'neutral' alveolar and retroflex consonants.[9]

[8] For a further discussion, see Viegas Barros (1999: 7–8 fn.9).

[9] In the case of palatalised stops, Catrileo gives [ť], a transcriptional equivalent of IPA [c], which is claimed to alternate with [t͡ʃ]. Here, I give only the affricate transcription. Note that the glosses attempt a single lexical or phrasal equivalent within the range of possible contextual interpretations of the stylistic/affective form. The tables are organised to highlight the different manners of articulation (in **red**), though often all coronals are affected.

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Table 4. Affective alternations in Catrileo (1986, 2010): alveolars and retroflexes

Neutral	gloss	Affected	gloss
tun**t**en	'how much?'	**t͡ʃ**uɲ**t͡ʃ**eɲ	'how much, please?'
		t̪u**n̪t̪**e**n̪**	'how much, already!?'
fej**t**i **t**a**t**i	'yes, that's it'	fej**t͡ʃ**i **t͡ʃ**a**t͡ʃ**i	'please believe me, that's it'
		fej**t̪**i **t̪**a**t̪**i	'that's it, don't ask again!'
siʎo	'partridge'	**ʃ**iʎo	'little/lovely partridge'
		θiʎo	'annoying partridge'
siʎŋaw	'wild radish'	**ʃ**iʎŋaw	'yummy wild radish'
		θiʎŋaw	'yucky wild radish'
nɨlan	'I did not grab'	**ɲ**ɨlan	'please, believe me, I did not grab'
		n̪ɨ**l̪**an	'I did not grab (how dare you suggest it)'
nɨʈ͡ʂam	'conversation'	**ɲ**ɨʈ͡ʂam	'a nice chat'
		n̪ɨ**t̪**am	'to have words'
lifkɨlej	'it is clean'	**ʎ**ifkɨlej	'it's really nice and clean'
		l̪ifkɨ**l̪**eji	'it's clean, for what it's worth'
ʈ͡ʂewa	'dog'	**t͡ʃ**ewa	'doggy'
		t̪ewa	'unpleasant dog'
ʈ͡ʂipape	'let them out!'	**t͡ʃ**ipape	'let the poor souls out'
		t̪ipape	'let them out, if you must'
ʐamtun	'question'	**ʃ**amtun	'nice question'
		θamtun	'darned question'
mɨ**ʐ**ke	'toasted flour'	mɨ**ʃ**ke	'yummy toasted flour'
		mɨ**θ**ke	'yucky toasted flour'

Table 5. Affective alternations based on neutral alveolar and retroflex consonants

Negative	Neutral		Positive
t̪	t	ʈ͡ʂ	t͡ʃ
θ	s	ʐ	ʃ
n̪	n		ɲ
l̪	l		ʎ

Throughout this subsection, our account provides a meta-analysis of Catrileo and other scholars' published claims and examples, which were checked with our consultant for insights and grammatical intuitions.

The overall pattern, schematised in Table 5, can be summarised as one where, when alveolars and retroflexes are palatalised, they express tenderness, small size, pleasure, or politeness. The same segments, when dentalised, express rudeness, indifference, sarcasm, or distaste. The process seems to target words from left to right, with initial coronals being consistently affected (cf. [ʈ͡ʂewa] → [t͡ʃewa]) and later coronals being more variable

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(cf. [tunten] → [t͡ʃuɲt͡ʃeɲ] ~ [t͡ʃunten]). In the absence of an initial coronal, a later coronal in the root morpheme tends to undergo the affective process (cf. [mɨzⱪe] → [miʃke]; see Section 6 for details).

Catrileo (1986, 2010) describes the palatalised forms as typical of children or child-directed speech as well as showing up in the speech of the elderly and in elderly-directed speech. This is a well-recognised semantic pattern for diminutives (Dressler & Merlini Barbaresi 1994, Jurafsky 1996, Ponsonnet 2018b). The same pattern, however, does not hold for dentalisation, which does not index any age group. Of particular interest are more extreme forms of the palatalised fricative, which result in the approximant [j], a feature found predominantly in child or child-directed speech. Examples are [**j**amtun] for 'wee/nice question' or [mɨ**j**ke] for 'yummy toasted flour'.

In parallel to the association with child language, the palatalised forms are also frequently linked to referents of a smaller relative size, in what may be termed an iconic or synaesthetic relationship (see Hinton, Nichols & Ohala 1994: 2, Section 5). The same does not seem to hold for the dentalisation pattern, which is not explicitly linked to large referents, despite this often being a feature of markers of pejoration or negative affect (see Sapir 1911, Silverstein 1994: 45–46, but see also Ponsonnet 2018b, Section 4).

While Catrileo (1986, 2010) reports that these stylistic alternations are productive in Central Mapudungun dialects and, to an extent, in the Mountain dialects (Pewenche), there are a number of alternants of individual lexical sets which, though identifiable phonologically are less semantically transparent. A few cases of these can be found in (3), as elicited from our consultant, Fresia Loncon.[10]

(3) a. [**nɨmɨn**] 'smell' ~ [**ɲ**ɨmɨ**j**n] 'aroma' ~ [**n̪**ɨmɨ**n̪**] 'stench'
b. [**ɨnɨn**] 'keep water in one's mouth' ~ [**ɨ**ɲɨ**j**n] 'delicious' ~ [**ɨn̪ɨn̪**] 'disgusting'
c. [ko**s̻**i] 'salty/sour' ~ [ko**t͡ʃ**ɨ] 'sweet'
d. [**s̻**afoj] 'break' ~ [**t͡ʃ**afoj] 'cough'
e. [fɨ**t**a] 'big/old/wise'~ [fɨ**s̻**a] 'big thing'~ [fɨ**t͡ʃ**a] 'big person'~ [fɨ**t̪**a] 'husband (big/stern)'

In other items, no alternation is evident, yet the target root has either a dental with negative connotations or a palatal with positive/diminutive connotations. These are evidenced in Table 6, and, as argued in Section 6.3, likely represent instances of the lexicalisation of

Table 6. Non-alternating, affective items

Negative		Positive/small	
connotation		connotation	
we**θ**a	'bad'	**ʃ**e**t͡ʃ**ɨ	'dwarf/gnome'
a**t̪**a	'bad/perverse'	pi**t͡ʃ**i	'small/wee'
ka**l̪**ku	'wizard'	**ʌ**u**ʃ**u	'newborn'
n̪ape	'slow/lazy'	**ɲ**a**ɲ**a	'beloved friend/sister'

[10] The case of [ɨnɨn] and its alternants comes from Painequeo et al. (2018) and Augusta (1916); that of [fɨta] and its alternants is from Zúñiga (2006: 341, fn. xii) and Zúñiga & Suter (2007).

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erstwhile affective alternations. There are, however, a substantial number of roots that have dentals or palatals without having any obvious affective connotations, past or present, as shown in Table 7.

Crucially, words that have dental or palatal consonants as their base form are also potential targets for the kinds of affective processes described by Catrileo (1986, 2010). On the one hand, palatals can be dentalised and dentals can be palatalised, producing the expected affective outcomes (negative and positive connotations, respectively), as evidenced in Table 8.

The case of pejorative dentalisation for underlying dentals and positive/diminutive palatalisation for underlying palatals is less straightforward, since the phonological correlate of the semantic/pragmatic shift coincides with the neutral form. For some speakers, the result may be seen as a 'double making' of place features (see Table 9). Indeed, Catrileo (2010) claims that the pejorative or negative affect form surfaces with an 'emphatic dental'. Interestingly, this claim is absent from Catrileo (1986) and is not reported elsewhere. A more deliberate, hyperarticulated form of the affective form, however, does not seem altogether unlikely, and our consultant, Fresia Loncon Antileo, was able to produce these, which, anecdotally, have a longer closure and greater apical protrusion (marked as 'half

Table 7. Non–affect-bearing items containing roots with dental and palatal consonants

Dental		Palatal	
θɨŋu-	'speak'	paʃɨŋka	'bronze'
t̪ue	'earth/ground'	ka**t͡ʃ**u	'grass'
pa**l̪**u	'paternal aunt'	**t͡ʃ**a**ʌ**a	'pot'
wɨ**n̪**	'mouth'	iwɨ**ɲ**	'grease/fat'

Table 8. Affective palatalisation of dentals and dentalisation of palatals in Catrileo (1986, 2010)

Neutral	gloss	Affected	gloss
θewmalen (~**s**ewmalen)	'prepare this for me'	**ʃ**ewmalen	'Please, prepare this for me'
θomo (~**s**omo)	'woman'	**ʃ**omo	'kind/lovely woman'
t̪ɨŋkɨlej	'They are calm'	**t͡ʃ**ɨŋkɨlej	'They are nice and calm'
n̪amu**n̪t̪**uj	'they go on foot'	**ɲ**amu**n̪t̪**u	'they go on foot, poor things'
l̪imɨŋe	'swallow!'	**ʌ**imɨŋe	'swallow for me, please'
t͡ʃalin	'greeting'	**t̪**a**l̪**in	'unpleasant greeting'
t͡ʃem	'what thing'	**t̪**em	'what unpleasant thing'
t͡ʃe	'person'	**t̪**e	'unpleasant person'
ɲom	'tame'	**n̪**om	'unpleasantly tame'
a**ʌ**kituen	'listen to me'	a**l̪**kituen	'for the last time, listen to me'

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Table 9. 'Emphatic' affect in dentals and palatals according to Catrileo (2010)

Neutral	gloss	Affected	gloss
t̪ɨŋkɨlej	'They are calm'	**t̪**·ɨŋkɨlej	'They are annoyingly calm'
n̪amun̪tuj	'they go on foot'	**n̪**·amu**n̪**·tuj	'they go on foot, foolishly'
l̪ɨmɨŋe	'swallow!'	**l̪**·ɨmɨŋe	'I command you to swallow'
t͡ʃalin	'greeting'	**ç**alin	'pleasant greeting'
t͡ʃem	'what thing'	**ç**em	'what little thing'
t͡ʃe	'person'	**ç**e	'cherished person'
ɲom	'tame'	**n**om	'lovely and tame'
a**ʎ**kɨtuen	'listen to me'	a**l**kɨtuen	'please listen to me'

long' [·] in Table 9).[11] In the case of palatals, positive affect seems to also rely on a more emphatic form in the affricates. Here, Catrileo (1986, 2010, 2022) reports that the affricate becomes a full post-alveolar stop (International Phonetic Alphabet [IPA] [ç], but [t·] in her transcription). The nasal and the lateral are, surprisingly, reported to become alveolar, i.e. [n] and [l] in Catrileo (2010) but not in Catrileo (1986). For the palatal fricative, no data are provided, probably due to the rarity of this sound outside of the context of affective palatalisation. Again, our consultant was able to produce the alternating palatal forms but considered both cases to be unnatural, which ultimately argues for these alternations being less regular than those where an actual change in place features is predicted. The patterns of affective alternations in palatals and dentals are summarised in Table 10.

Where no coronals are available to undergo these affective processes, speakers use lexical resources to similar ends. In the case of diminution or positive affect the adjective [pi**t͡ʃ**i] is quite frequent, allowing, according to our consultant, for a sarcastic interpretation when dentalised, as in [pi**t̪**i waka] 'pesky little cow'. For negative affect, forms of the adjective [we**θ**a] 'bad' are often used, as in [we**θ**a paŋi] 'bad mountain lion' or attenuated to [we**ʃ**a jeku] 'naughty/silly crow'.[12]

Table 10. Affective alternations based on neutral palatal and dental consonants

Negative affect	Neutral affect	Positive affect
t̪· ?	t̪	t͡ʃ
?	θ	ʃ
n̪· ?	n̪	ɲ
l̪· ?	l̪	ʎ
t̪	t͡ʃ	ç ?
n̪	ɲ	n ?
l̪	ʎ	l ?

[11] This observation is likely in line with the well-attested pattern of both segmental and supra-segmental elements playing a role in the production of sound-symbolic effects (see Dingemanse et al. 2016).

[12] Occasionally, morphological means may covey similar semantic or pragmatic effects. We see this with diminutive suffix [-ɨʎ] in Section 4.1 and with the ineffectual suffix [-piθa] in Section 4.3.

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While the most detailed description of these 'stylistic' shifts is given in Catrileo's work, contemporary linguistic descriptions tend to acknowledge the existence of affective changes, with greater or lesser degree of exemplification (cf. Suárez 1959, Erize 1960, Moesbach 1962, Croese 1980, Salas 1992, Zúñiga 2006, Hernández et al. 2006, Cañumil 2011). Generally, the palatalising changes are more conspicuous and are the subject of explicit discussion. Dentalisations are often overlooked, which may be the result of their misperception by non-native researchers or the general attrition of the contrasts in some dialects (see Molineaux 2022). A case of this particular scenario is Smeets' (2008: 30–35) grammar, where her main consultant Luis Quinchavil – a Central Mapudungun speaker – was able to recognise all dental-alveolar distinctions but only produced them consistently for fricatives. As a result, Smeets gives extensive exemplification of palatalisation alternations and of dentalisation only in the fricatives, claiming that the obstruents, nasals, and laterals do not show a clear dental-alveolar opposition.

For speakers in the Argentinian province of Chubut, Díaz-Fernández (2007) observes a similar though more restrictive pattern of alternations than those proposed by Catrileo (1986, 2010). While the palatalisation patterns are almost identical, the dentalisation was observed only for oral obstruents (/t͡ʂ/ →/t̪/ and /ʐ/ →/ð/). Interestingly, here the palatalisation process is claimed to have been expanded beyond coronals to labio-dental /f/, at least in one item ([ko**f**ke] 'bread' vs. [ko**ʃ**ke] 'lovely/little bread') and to velar /ŋ/ in another item ([fante**ŋ**(e)i] 'it's this size' vs. [fante**ɲ**i] 'it's this wee size').[13] Díaz-Fernández does comment, however, on the difficulties of eliciting these forms as a non-native researcher, especially considering that she takes these to be 'weak and unstable structures, such that there are closely related and rather mobile synchronic strata in which diachronic residues and innovative tendencies compete' (2007: 6).[14] Given this picture of variation in the contemporary dialects, we turn to the diachronic evidence in order to help elucidate the existing patterns.

3. Reconstructing consonant alternations in the historical record

Following Villena (2017), the textual record for Mapudungun can be split into four major periods, as in Figure 1. In the upcoming subsections, we examine the data for the missionary and ethnographic periods, since the pre-textual data are mostly onomastic and too sparse, and we have already examined much of what would fall under the institutional period. The data in what follows are gathered through searches both in the published, tagged version of

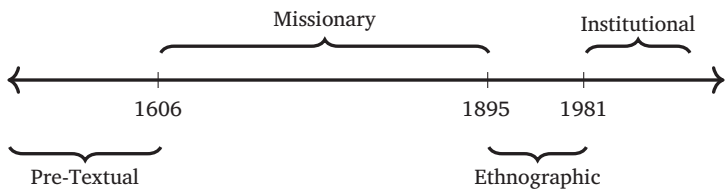

Figure 1. Mapudungun textual production periods according to Villena 2017.

[13] The example of [fante**ɲ**i] might not be a case of affective alternation at all, but rather the coalescence of the vowels [ei] into [i] and sporadic palatalisation before high-front vowels (see Section 6.2).

[14] 'estamos frente a estructuras débiles e inestables, a modo de un espesor sincrónico de estratos interrelacionados y más o menos móviles, en el cual se enfrentan residuos diacrónicos y tendencias innovadoras'.

https://doi.org/10.1017/S002222672500012X Published online by Cambridge University Press

the *Corpus of Historical Mapudungun* (Molineaux & Karaiskos 2021) and in the untagged texts available through its source page (Molineaux 2024; see also Molineaux 2023).

3.1. Coronal alternations in the missionary period

3.1.1. *The turn of the seventeenth century (Valdivia 1606, 1621)*

The earliest surviving Mapudungun materials are the work of a Spanish Jesuit, Father Luys de Valdivia (1560–1642). His grammar (1606) – based mostly on Northern Mapudungun sources – describes a recognisable coronal inventory (see Table 11).

Compared to the present day (see Table 1), the main difference with Valdivia's inventory are (a) the voicing of fricatives, (b) the apparent absence of the /s/ and /ʃ/ phonemes, and (c) the lack of discernible contrast between dental and alveolar stops.[15] Difference (a) is expected, since to this day, the voicing of fricatives remains a major isogloss separating northern and mountain dialects from Central Mapudungun (Croese 1980, Molineaux 2022). Regarding (b), the /s/ and /ʃ/ phonemes are still evidently incipient. In both Valdivia's grammar and sermons (1621), all <s> forms we find are transparently of Quechuan (e.g. *suysuy* 'collinder'; *misky* 'honey/sweet')[16] or Spanish (e.g. *ispada* 'sword'; *Dios* 'God') origin. As for /ʃ/, or its voiced counterpart, /ʒ/, there is no straightforward spelling to represent it, based on sixteenth-century Spanish (or Latin). There are a couple of instances of <z>, however, that may represent the relevant sound in words of Quechuan origin, such as <pozco> 'yeast' and <mizky> 'honey'.[17] Interestingly, however, in items where we would expect affective palatalisation of /zʲ/ or /ð/, we find spellings with <y>, particularly for the interjection <cuye> or <cuy>, used as an exhortation by women towards other women. We assume this is a palatalised form of /kuzʲe/ 'wife',[18] probably representing the gliding form /j/.

Table 11. Consonant inventory for late–sixteenth-century Northern Mapudungun, based on Valdivia (1606)

	Labial	Dental	Alveolar	Retroflex	Postalveolar/palatal	Velar
Stop/affricate	p	t̪/t		ʈ	t͡ʃ	k
Fricative	v	ð	(s)	ʐ	(ʒ)	
Nasal	m	n̪	n		ɲ	ŋ
Lateral		l̪	l		ʎ	
Approximant	w				j	ɯ

[15] I also take the retroflex stop to lack the affrication of contemporary dialects, as argued in Molineaux (2021: 33 fns.10 and 2022: 665). The proposed IPA transcriptions, here and elsewhere, are based on my own interpretation of the authors' stated spelling practices. For Valdivia, in particular, a more detailed analysis can be found in Molineaux (2021); for Febrés, see Molineaux & Loncon (2024).

[16] Another seventeenth-century example of /s/ in Quechuan borrowings is the word for 'glass', *kespi*, which shows up as <kispi> in a Mapudungu-Latin vocabulary compiled by Dutch explorers (Herckmans 1642) and based on the southernmost dialect, Huilliche.

[17] Here, it is unclear whether the proposed palatal is etymological or the result of an active process of palatalisation, since different possible source languages within the Quechuan family would have had palatalised variants, and a similar process of affective palatalisation has been described for some of them (de Reuse 1986, Halm 2020).

[18] At this stage, we conjecture that the word probably had a more general meaning of 'grown/adult woman', since both affective forms [kuʃe] and [kuθe] today refer to an older woman (positively or negatively) more than her marital

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Table 12. Sample items with dental and palatal consonants in Valdivia (1606, 1621)

Dental			Palatal		
<co**d**e>	[koðe]	'stupid'	<**ch**i>	[pʧi]	'small'
<hue**d**on>	[weðon]	'wound the head'	<ca**ch**omin>	[kaʧomin]	'pacify'
<ù**d**en>	[ɨðen]	'despise'	<**ñoch**i>	[ɲoʧi]	'a bit'
<**l**'an>	[l̪an]	'death'	<**ll**a**ll**in>	[ʎaʎin]	'skinny'
<hue**ld**ùduam>	[wel̪ɨðuam]	'cruel'	<ya**ll**>	[jaʎ]	'child/ offspring'
<**ld**uquin>	[l̪ukiɲ]	'dirty'	<**ll**adqmin>	[ʎadkmin]	'pity someone'
<**n**'otumin>	[n̪otumin]	'act stubbornly'	<**ñ**omclen>	[ɲomklen]	'quiet'
<**n**'oùg̃en>	[n̪oɨŋen]	'be pugnacious'	<**ñ**uque>	[ɲuke]	'mother'

Regarding the stops (difference c), it is worth saying that a distinction between the Mapudungun alveolar and the dental was not observed until the late nineteenth century. This selective 'deafness' was likely the result of the overlapping properties of the two Mapuche stops vis-à-vis the Spanish one. Indeed, already at the turn of the seventeenth century, coronal stops in Spanish were probably (post)dentals (Penny 2002: Section 2), thus sharing the dentality of the Mapudungun (inter)dental stops and the apicality of the Mapudungun alveolars. To this we add the fact that minimal pairs are rare, and the dental phoneme has a very low lexical incidence overall today (see Molineaux 2022: 663). The result is that the distinction probably fell under the radar for grammarians. I believe this scenario is far more likely than that of a later split between dental and alveolar stops, given the lack of a unifying environment for such a change.

While Valdivia (1606) provides no metalinguistic commentary on coronal alternations, we do note that there is a strong tendency for the use of explicitly palatal spellings (<ñ, ch, ll> for /ɲ, ʧ, ʎ/), in words with inherently positive connotations or which show affective alternation today, and explicitly dental spellings (<d, n', ld/l'> for /ð, n̪, l̪/) for words with negative connotations or affective alternations today, as can be seen in Table 12.[19] In particular for the dental nasals and laterals, the spelling evidence shows inconsistency, very often lacking the diacritic or diagraphic marking that distinguishes them from the corresponding alveolar.[20]

It is also worth noting a few scattered instances of alternations found by contrasting forms across Valdivia's grammar and sermons, as in Table 13. These appear to match the expected pattern, despite no explicit treatment in the text and variably transparent semantics.

Despite the sparsity of the data, it seems that there is good reason to believe that a form of the affectively governed alternations was already present in the earliest records for Mapudungun. Particularly instructive is the alternation of the words for 'bad' (Table 13g). Valdiva's vocabulary (appended to his grammar) lists the word as <hue**r**a>, and this is the

status. The lexical shift to 'wife' was likely the result of co-occurrence and potentially contact with Spanish where *mujer* can have both the meaning 'wife' and 'woman', in a possessive construction.

[19] According to Augusta's dictionary (1916), [weluθuamin] means 'to be distracted, mindless, confused'.

[20] The only two items that are spelled often and consistently as dentals are the verbal stem [l̪a-] 'die' and the adverb [al̪i] 'too much', which argues for the salience of the dental in contexts of negative affect and augmentation.

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Table 13. Sample items with dental and palatal variants in Valdivia (1606, 1621)

	Alternat A			Alternant B		
a.	<po**z**ko>	[po**ʒ**ko]	'yeast'	<pu**d**ku>	[pu**ð**ku]	'yeast'
b.	<**ld**uquin>	[**l̪**ukiɲ]	'dirty'	<**ll**uquingetupe>	[**ʎ**ukiŋetupe]	'they will be soiled'
c.	<**y**ullin>	[**j**u**ʎ**in]? [**ʒ**u**ʎ**in]?	'bee'	<**d**ullin>	[**ð**u**ʎ**in]	'bee'
d.	<ù**l**cha>	[i**ɬt͡ʃ**a]	'married woman'	<ù**ll**cha>	[i**ʎt͡ʃ**a]	'maiden'
e.	<vù**t**a>	[vi**ɬt**a]? [vi**ɬ̪**a]?	'big/old/ husband'	<vù**ch**a>	[vi**ɬt͡ʃ**a]	'big/old'
f.	<cu**r**e>	[ku**ʐ̪**e]	'married woman'	<cu**d**e>	[ku**ð**e]	'old woman'
g.	<hue**r**a>	[we**ʐ̪**a]	'bad'	<hue**d**alay>	[we**ð**alay]	'they are not bad'

Table 14. 'Neutral' consonants in Valdivia (1606, 1621) vs. present-day 'affected' consonants

<wera>	'bad'	>	[weθa] (never [we**ʐ̪**a])
<por>	'dirty'	>	[poθ] (never [po**ʐ̪**])
<coilla>	'lie'	>	[koj**l̪**a] ([koj**ʎ**a] as 'affective')
<calcu>	'wizard/witch'	>	[ka**l̪**ku] (never [kalku])

form that shows up 69 times in the sermons. The alternative, dental form <hue**d**a-> shows up only in two negative forms in the same text (<hue**d**alay> 'they are not bad' and <hue**d**alayay> 'they will not be bad'). Crucially, the inherent root semantics of the item has very obvious negative connotations, so the forms with <d> appear to double mark this negativity. The long-term result, we propose, is that the repeated emphatic marking of negativity of the form led to greater and greater proportions of dentals being used, ultimately replacing the original neutral form. Indeed, today speakers no longer use /we**ʐ̪**a/, but /we**θ**a/ (see Sadowsky et al. 2019), and even /we**ʃ**a/, meaning 'naughty, mischievous'. Similar cases where we find evidence for a historically neutral consonant replaced today by an 'affected' one can be found in Table 14, which we suggest are the lexicalisation of the affect-marked items.[21]

Beyond this pattern of lexicalisation of affective forms, this earliest stage does not seem to suggest a situation that differs radically from what we find in the present-day data. Indeed, palatals and dentals appear to be used in affectively neutral contexts as well,[22] such as those in Table 15, just as they are today (see Table 7).

[21] Also noteworthy is the change in the form for 'wizard/witch' – now dental – which is likely to have changed its meaning in the context of Christianisation. Indeed, Valdivia explicitly rails against <pu ca**l**cu> 'witches/wizards' in his sermons, calling them 'deceivers' and 'devil worshippers'.

[22] Barring the palatal fricatives, which – at least partially – seem to emerge as a result of diminutive palatalisation, and the dental stops, which were not recorded until the late nineteenth century.

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Table 15. Affect-neutral dentals and palatals in Valdivia (1606, 1621) and their twentieth-century reflexes (Augusta 1916)

<pe**ld**>	[peld̪]	>	[peld̪]	‘neck’
<q**ld**uy>	[kld̪uj]	>	[kɨld̪wi]	‘(dried) beans’
<keu**n**’>	[kewɨn̪]	>	[kewɨn̪]	‘tongue’
<ve**n**’>	[ven̪]	>	[fɨn̪]	‘flesh’
<a**d**>	[að]	>	[aθ]	‘face’
<ú**d**um>	[ɨðum]	>	[ɨθɨm]	‘gums’
<ay**ll**a>	[ajʎa]	>	[ajʎa]	‘nine’
<wi**ll**i>	[wiʎi]	>	[wiʎi]	‘north’
<**d**a**ñ**e>	[daɲe]	>	[daɲe]	‘nest’
<**d**ñin>	[ðɲin]	>	[θɨɲiɲ]	‘eyebrows’
<**ch**iway>	[t͡ʃiwaj]	>	[t͡ʃiwaj]	‘mist’
<ke**ch**u>	[ket͡ʃu]	>	[ket͡ʃu]	‘five’

3.1.2. *The eighteenth century (Febrés 1765, Havestadt 1777)*

Two grammars of Mapudungun, with a variety of accompanying texts, were published by Jesuit priests in the eighteenth century. The first, penned in Spanish by Andrés Febrés (1734–1790), a Catalan, is explicit in its metalinguistic commentary on coronal alternations:

> the Indians [sic] tend to turn some letters into others… the *t* [t] and the *th* [t̪] into *ch* [t͡ʃ] primarily to speak lovingly, *vochùm*, in place of *votùm* – the son… the *n* [n] into *ñ* [ɲ] quite often, as is the case of the *l* [l] into *ll* [ʎ], e.g. *ñagh*, for *nagh* – below: *llamgen* for *lamgen* – the sister: the r [ɾ] into d [ð] and further into the *ja, jo, ju* of Catalan or *gia* of Italian or *ge, gi* of French [ʒ], to speak affectedly, which sounds a bit like *s*, as in *duca*, *juca*, for *ruca* – the house: *cujam*, for *curam* – egg (1765: 6, IPA characters inserted).[23]

The second grammarian was Bernard Havestad (1714–1781), a Westphalian, who produced his description in Latin. Similar to Febrés, he claims a range of affective and stylistic effects of consonant alternations:

> The Chilean Tongue takes license to replace one letter for another, to create diminutives, express love, affect and tenderness, because they care about the elegance of words, the veneration of speech and the fame of eloquence, or even at the discretion and choice of each. Therefore the following are synonymous… *cal* [kal], *call* [kaʎ]; wool: *lamûen* [lamɯen], *llamûen* [ʎamɯen]; sister: *Chili* [t͡ʃ͡ʃili], *Chilli* [t͡ʃ͡ʃriʎi]; Chile: *colù* [kolɨ], *collù* [koʎɨ]; bright red; *moGeli* [moŋeli], *moGelli* [moŋeʎi]; if I live: *ruca* [ɾɯka], *duca* [ðuka], *suca* [ʒuka]; house: *huera* [weɾa], *hueda* [weða], *huesa* [weʒa];

[23] ‘Suelen los Indios mudar algunas letras en otras … la *t* y la *th* en *ch* principalmente para hablar cariñoso, *cochùm*, por *votùm* – el hijo … la *n* en *ñ*, y esto muchas veces, como tabien la *l* en *ll*, v.g. *ñagh*, por *nagh* – abaxo: *llamgen* por *lamgen* – la hermana: la *r* en *d* y más en el *ja*, *jo*, *ju* Catalan, ò *gia* Italiano, ò *ge*, *gi* Francés, para hablar melindroso, que se parece algo à la *s*, como *duca*, *juca*, por *ruca* – la casa: *cujam*, por *curam* – huevo.’ The IPA transcriptions here, as in other historical materials, are based on our analysis of the authors’ own explanations of their spelling choices.

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bad: *carù* [kaz̪i̪], *cadù* [kaði̪], *casù* [kaʒi̪]; green, raw: *anùn* [an̪i̪n], *añun* [aɲi̪n]; I sit: *ùñm* [i̪ɲm], *ùnm* [i̪nm]; bird (1777: 8).[24]

The majority of the alternations described by Febrés and Havestadt regard palatalisation and positive affect or diminution. This is particularly explicit in Havestadt, who claims letters are often replaced by others that are 'more gentle, soft, tender' (1777: 135) in order to create *diminutives* as in <fo**ch**um> for <fo**t**um> 'sonny'; <qui**s**ulen> for <qui**d**ule> 'I am alone'; <**s**iu> for <**r**iu> 'goldfinch',[25] very much implying a sound-symbolic association.

Febrés also exemplifies the use of palatalisation as a mitigation strategy, in the transcript of a conversation between two Mapuche chiefs, one is made to say 'I don't come here to tell you (little) lies', where 'lies' shows up as <coy**ll**a> [kojʎa] (4) instead of present-day [koj**l̪**a]. The palatalisation, we claim, represents a politeness and mitigation strategy that our present-day consultant recognised as being very productive in her own speech and which is also a cross-linguistically common trait of diminutives (cf. Ponsonnet 2018b for a recent survey).

(4) Palatalisation as mitigation in Febrés (1765)[26]

inche	*coy**ll**atupaquelayu*
int͡ʃe	kojʎa-tu-pa-ke-la-ju
1s	lie-TR-CIS-HAB-NEG–1s.A.2s.P

'I don't come here to tell you (little) lies'

Only among the fricatives are the dentals represented explicitly by Febrés and Havestadt, always using the grapheme <d>. Indeed, Havestadt mentions that speakers 'freely' say <pran>, <psan>, <pdan>, and <pxan> for 'descend' (1777: 103).[27] However, the affective undertones become clear in Havestadt's word lists, where we are told 'it displeases older women to be called *cude* [kuðe]', while 'it pleases them to be called *cuse* [kuʒe]'(635).

As regards other manner segments, Febrés does mention the existence of words where <n> and <l> are pronounced by 'bringing the tip of the tongue onto the teeth'. However, he concludes that it is not worth transcribing this distinction since 'they use it in very few words, and their difference in sound is almost imperceptible without listening with particular care' (1765: 5).[28]

The spelling evidence across both works, however, suggests some use of <ld> in places where we expect the dental lateral, such as <pù**ld**ù> for 'fly (insect)' and <a**ld**ù> for 'too much', matching /pi̪**l̪**i̪/ and /a**l̪**i̪/ in present dialects. We further find cases of apparent

[24] 'Sumit sibi Lingua Chilensis licentiam usurpandi unam litream pro alia; idque I. ut formet Diminutiva V. n 273. 2dò ad significandum affectum amoris, bladitas &c. 292. 3tiò. quia aucupantur verborum concinnitatem, orationis cultum, famamque eloquentia… Hinc sunt synonima: *cal*, *call*; lana: *lamûen*, *llamûen*; soror: *Chili*, *Chilli*; Regnum Chilense: *colù*, *collù*; color heluus ravus; *moGeli*, *moGelli*; si vivam: *ruca*, *duca*, *suca*; domus: *huera*, *hueda*, *huesa*; malus, a, um: *carù*, *cadù*, *casù*; viridis, crudus: *anùn*, *añun*; sedeo: *ùñm*, *ùnm*; avis.' Here, we have replaced the gothic characters for 'g' and 'n' by <G> and <ñ>.

[25] We assume here that <s> most likely represents a palatal form: [ʒ] or [ʃ].

[26] Glossing: 1: first person; 2: second person; A: agent; CIS: cislocative; HAB: habitual; NEG: negative; S: singular; P: patient; TR: trasitiviser.

[27] Note that Havestadt tells us that <x> represent the sound of Portuguese, so most likely a post-alveolar [ʃ].

[28] 'en algunas palabras pronuncian la *l*, y la *n*, arrimando la punta de la lengua a los dientes; pero es mejor omitir la molestia de ponerles virgulita encima, ù otra señal, porque lo usan en muy pocas palabras, y casi no se percibe su diferente sonido, sino atendiendo con particular cuidado.'

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'deprecative' dentalisation using the <ld> digraphs in Febrés' transcriptions. For instance, <pe**ld**e> appears alongside <pe**l**e> for 'mud' (today /pe̪̲le/), and <ma**ld**ùtuuymi> meaning 'touch yourself' is used in the Mapudungun *Confessionary* he includes in the work, implying a moral reproach in that context. No orthographic evidence is recoverable for the dental nasal (or, indeed for stops, which we assume were not described rather than not being present, as argued in Section 3.1.1).

In short, then, the missionary period[29] shows some evidence for the 'stylistic' alternations of the kind described for present day forms of the language, but the nature of the orthographic systems as well as the narrow focus of the corpus materials makes it difficult to find clearer instances, particularly of the dental-pejoration cases. Furthermore, there is evidence for the lexicalisation of palatalised and dentalised forms in words with inherently diminutive/positive or deprecative semantics.

3.2. Coronal alternations in the ethnographic period (1895–1981)

Influenced by the study of folk traditions in Europe and the emerging field of dialectology, from the late nineteenth century onward, the documentation of Mapudungun took on a more academic approach (see Malvestitti 2012: 20–24, Pozo 2018). Work in the field attempted to represent traditional culture and language and as such gathered a more varied and nuanced corpus. In many of these cases, we know the names of the individuals who provided the exemplars as well as a number of facts about their biographical, cultural, and linguistic background. Advances in linguistic training also allowed for greater precision in the transcription of materials, which were recorded as articulated by speakers rather than as instruments of Christian doctrine. These new materials allow us a closer look at the relationship between affect and pronunciation.

3.2.1. Ethnographic materials in Ngulumapu (western Mapuche territories)

The work of German-born linguist Rudolf Lenz (1863–1938), primarily in his *Estudios Araucanos* (1895–1897), set the stage for the ethnographic approach to Mapudungun. Having obtained his doctorate in Bonn in 1886, Lenz was trained in the latest phonetic transcription innovations and applied these to eliciting traditional texts from native speakers in an array of locations of the Chilean territories. Despite this, he only came to identify the full range of dentals after his main consultant, a Pewenche (Mountain Mapuche) man called Kallfün, explicitly helped him notice it. 'Calvún, docile as ever, finally lifted his head at each *fen·t·e* [fen̪̲t̪̲e], *mət·e* [mət̪̲e], etc. in order to show me the tip of the tongue peaking between his teeth; he clearly distinguished by ear whether I repeated *n·* [n̪̲] or *n* [n], etc.' (1897: 130).[30]

[29] Although a minor work and heavily reliant on Febrés' grammar, Lieutenant Colonel Federico Barbará (1828–1893) of the Argentinian army also composed a brief guide to the language (Barbara 1879), as spoken by the Mapuche of the pampas on the eastern side of the Andes. In those materials, we find instances of the key alternations, even when no comment is made on their affective implications: <fo**t**ùm> vs. <fo**ch**um> 'son'; <cha**l**e> vs. <cha**ll**e> 'in-law'; and <hue**z**a> vs. <hue**r**a> 'bad' (after Peninsular Spanish, <z> is used to represent [θ]). Again, evidence for dentalisation is rare outside of fricatives. Similarly, we see digraphic spellings that appear to represent [l̪̲], as in <a**ld**ù> '(too) much' and <ma**lz**ún> meaning 'dishonest/immodest touching'. The Abbé Molina's *Civil History of Chile* (1795) also comments on <r–s> alternations in the central dialects of Mapudungun.

[30] 'Calvun, dócil como siempre, al fin levantó en cada *fen·t·e mət·e* etc. la cabeza para mostrarme la punta de la lengua que se asomaba entre sus dientes; él distinguió claramente por el oído si yo repetía *n·* o *n*, etc.'

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Table 16. Sample items with dental consonants in Lenz (1897)

	Dental	
<**l**·ayaimi>	[**l̪**ajajmi]	‘you will die’
<koṇkə**l**·>	[koŋkə**l̪**]	‘growl’
<fü**tt**·a>vs.<fü**tt**a>	[fɨ**t̪**ːa]vs.[fɨ**t**ːa]	‘husband/big’
<mə**tt**·e we**d**a>vs.<mə**tt**e>,<we**r**a>	[mə**t̪**ːe we**θ**a] [mə**t**ːe] [we**ʐ̪**a]	‘very bad’
<**n**’ümə**n**’ṇei> vs. <**n**ümü**n**>	[**n̪**ɨmə**n̪n̪**ŋej]vs.[**n**ɨmɨ**n**]	‘it stinks’ ‘smell’
<me**tt**·e po**d**ṇei>	[me**t̪**ːe po**ð**ŋei]	‘it is very dirty’
<fen**t**·epu**n**·>vs.<fen**t**’epun>	[fe**n̪t̪**epu**n̪**]vs.[fen**t͡ʂ̪**epun]	‘(so) very much’
<ku**d**ü>vs.<ku**r**ü>	[ku**θ**ɨ]vs.[ku**ʐ̪**ɨ]	‘black’

Table 17. Sample items with palatal consonants in Lenz (1897)

	Palatal	
<**sh**iwén>	[**ʃ**iwen]	‘companion’
<ü**sh**ketu pamən>	[ɨ**ʃ**ketupamən]	‘come rest’
<fü**ch**a>	[fɨ**t͡ʃ**a]	‘big’
<ṇi**ʎ**a**ñ**>	[ŋi**ʎ**a**ɲ**]	‘in-law’
<ma**ʎ**>	[ma**ʎ**]	‘tame’
<**ñ**o**ch**i>	[**ɲ**o**t͡ʃ**i]	‘softly/slowly’
<**ʎ**amṇén>	[**ʎ**amŋen]	‘sister’
<**ʎ**ig>vs.<**l**ig>	[**ʎ**iɯ]vs.[**l**iɯ]	‘white’

Lenz, furthermore, acknowledges the use of consonantal alternations in ‘the language of affect’ and ‘to vary a bit the meaning’ in words such as <wed·a–wesa–wera> ([weða–wesa–weʐ̪a]) ‘bad’ and <kure–kuye–kuzhe–kude> ([kuʐ̪e–kuje–kuʒe–kuðe]) ‘wife/old woman’ (131). However, he also states that his published materials are insufficient for the purposes of a full study of the matter, since he has ‘not paid sufficient attention to the matter and perhaps involuntarily made uniform in the transcription what in the mouth of the Mapuche was intentionally distinct’ (Lenz 1897: 130).[31]

Despite these caveats, we see a certain amount of consistency in the use of both palatal and dental forms, given the respective positive and negative connotations of the words they appear in. A sample of such words is given in Tables 16 and 17.[32]

Similar to Lenz, the Bavarian Franciscan priest Félix de Augusta (1860–1935) only comes to incorporate dental stops in his 1910 *Lecturas Araucanas*, at the behest of Domingo Wenuñamko, one of his Mapuche collaborators. Despite acknowledging the relevant palatal and dental alternations, Augusta provides no systematic analysis of their context in his

[31] El araucano usa sin duda diferentes articulaciones, no solo para el lenguaje del cariño, sino para variar un poco el valor significativo, como en *wed·a-wesa-wera*, *kure-kuye-kuzhe-kude.* Los materiales míos publicados hasta aquí no son suficientes, porque no me he fijado lo suficiente en el asunto y quizás involuntariamente he uniformado en la trascripción lo que en boca del indígena fue intencionalmente algo distinto.

[32] Note that the term [ŋiʎaɲ] is often translated as a relationship of ‘affinity’, particularly referring to the ‘wife’s father/daughter’s husband and wife’s brother/sister’s husband, respectively’ (Course 2011: 88).

https://doi.org/10.1017/S002222672500012X Published online by Cambridge University Press

trilogy of works on Mapudungun (1903, 1910, 1916). The main exception to this is the claim, in the second edition of his *Lecturas* (1934: 202) that the replacement of <r> by <d> ([ɻ] by [θ]) in the evidential suffix [-ɻ̨ke] (see Section 4.2) is a sign of anger, as in <wentru**d**kelle> 'it is indeed a man (regretably)' or <ŋekatu**d**kellelai> 'it is not this again (regretably)'. An opposite, pleasurable connotation is said to be attached to <**sh**omo**sh**kelle> 'it is indeed a woman (fortunately)', where both the initial /θ/ and suffixal /ɻ̨/ of /**θ**omo**ɻ̨**keʎe/ 'it is indeed a woman' are palatalised.[33]

The work of the first published Mapuche ethnographer, Manuel Manquilef (1911, 1914), brings together extremely authentic materials. However, his orthography is somewhat standardised, insofar as the allophonic variation is stripped away, lacking the explicitness of the non-native observer. This probably results from a standard language ideology modelled on Spanish. Hence, we see that the word for 'bad' is always <we**d**a> and not <we**r**a>, as in earlier sources. We also see a clear division between <fü**ch**a> meaning 'old' and <fü**t**a> meaning 'big', possibly a partially lexicalised politeness or deference strategy relating to old age. While no immediately identifiable dentalisations can be found in Manquilef's work, we do find cases of palatalisation, as in the case of <**z**aki**ñ**> [**ʒ**aki**ɲ**] glossed as 'love' or 'enjoyment' for what is elsewhere [**ʒ̨**aki**ɲ**] 'thought'.

The most emblematic of the ethnographic texts is likely the autobiography of Longko (Chief) Paskual Koña (late 1840s–1927), transcribed by Wilhelm de Moesbach (1930), another Bavarian Franciscan. Although somewhat standardised in its spelling practices, we do see evidence for inherently affect-laden words having dentals and palatals, such as <l·an> [**l̪**an] 'death', <mën·a> [mə**n̪**a] 'much', <pod> [po**ð**]; 'dirty', <ñañai> [**ɲ**a**ɲ**aj] 'female salutation', <misha> [mi**ʃ**a] 'companion', <chachai> [**t͡ʃ**a**t͡ʃ**aj] 'daddy'. Occasionally, there are transparent relations between the affective form and other forms, as in the case of [**ʒ̨**aki] 'think, calculate' and [**ʃ**aki] 'respect, think highly of', as in (5), where we see palatalisation as a form of deference.

(5) Palatalisation as deference in (1930: 14)[34]

a. *Mëtewe*	***sh**akiŋefui*	*fillpëlle*	*tëfachi*	*mapu*	*mew*
mətewe	**ʃ**aki-ŋe-fu-j	fiʎ-pəʎe	təfa**t͡ʃ**i	mapu	mew
much	think-PASS-RI-3.IND	all-near	this	land	in
'He was much respected by all in these parts'					

A particularly revealing example of the unique status of dental elements in the speech of Paskual Koña is the contrast between the dental and alveolar lateral in the presumably onomatopoetic item <ful·> [fu**l̪**] 'thump' (6a, b) as compared to the related verbal root <ful-> [fu**l**-] 'dump' (6c). Interestingly, the dental appears to be used in the transparently imitative form – which represents an abrupt or loud event – while the alveolar shows up in the more conventionalised, lexical form. This pattern, we suggest, may hint at a divide in the sound inventory of the language, such that some segments are more prone to sound-symbolic associations (see also Antivero 2019), a pattern that would fall neatly in with known descriptions of ideophonic lexis (cf. Dingemanse 2023). In support of this possibility,

[33] A possible case of pejorative [t̪] might be in the word <te> which Augusta (1910: 155 fn.3) says has a 'peculiar sound' and is used to address different characters of a story in an accusatory fashion. Here we suggest this is simply a pejorative/dentalised form of [t͡ʃe] 'person', as described by Catrileo (2022: 129).

[34] Glossing: 3: third person; IND: indicative; RI: ruptured implicature (see Golluscio 2000); PASS: passive.

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consultation with Fresia Loncon reveals that this pattern seems to hold, where dental [l̪] is more evocative of abruptness or coldness than [l], at least for some speakers of Mapudungun.

(6) Imitative and lexical forms in Coña (1930)[35]

a. *«**ful**·»* *pi* *ti* *karoti;* *naqi* *manshana* *pülli* meu
ful̪ pi-i ti karoti naɯ-i manʃana pɨʎi mew
thump say-3.IND DET club down-3.IND apple ground in
'«thump» says the club; the apples fall on the ground'

b. *Neikufi;* ***ful·ful***· *üi* *ñi*
nejku-fi ful̪ ful̪ ɨj ɲi
loosen–3P.3A.ind thump-REDUP sound.3.IND POSS–3S
naqn *tëfachi* *manshana*
naɯ-n təfat͡ʃi manʃana
down-NLZ these apple
'he loosens them; 'thum-thump' sounds the fall of these apples'

c. ***ful****intëkuŋekei* *kiñe* *epu* *külko* *fën* *manshana*
ful-in-təku-ŋe-ke-j kiɲe epu kɨlko fɨn manʃana
dump-NLZ-place-PASS-HAB–3.IND one two basket fruit apple
'some two baskets of apples were dumped in'

In his grammatical sketch of Mapudungun, Moesbach (1962) also makes some interesting observations regarding diminutives and augmentatives. For the first, he harks back to Havestadt (Section 3.1.2) in claiming that, to create words analogue to Spanish ones with *-ito* (the diminutive), speakers 'change a hard consonant into a soft one' (38), which he exemplifies with <fótəm> [fo**t**əm] 'son' vs. <fo**ch**əm> [fo**t͡ʃ**əm] 'sonny', <domo> [**θ**omo] 'woman' vs. <ʃomo> [**ʃ**omo] 'little woman', and <duam> [**θ**uam] 'business' vs. <ʃuam> [**ʃ**uam] 'favour'. More surprising, however, is his suggestion of the suffix <-rke> [-**ʐ̩**ke] as a means to create augmentatives like those with Spanish <-azo>. His examples are <trewa> 'dog' vs. <trewa**r**ke> 'big dog' and <üñəm> 'bird' vs. <üñəmə**r**ke> 'big bird'.[36] The reasons for this are less clear but may relate to the mirativity of the suffix as well as its frequent alternation with the dental form <-dke> [-**θ**ke]. We will return to this question in Section 4.2.

3.2.2. Ethnographic materials in *Pwelmapu* (eastern Mapuche territories)

The historical evidence for Argentinian varieties of Mapudungun is sparser; however, for the turn of the twentieth century some clear data for alternations are available from the work of the German ethnographer Robert Lehmann-Nitsche. Only published by Malvestitti in 2012, his transcriptions of Pwelmapu materials span nearly three decades (1899–1826) and reflect

[35] Glossing: 3: third person; DET: determiner; HAB: habitual; IND: indicative; NLZ: nominaliser; PASS: passive; POSS: posessive; REDUP: reduplication; S: singular.

[36] 'Usan también otro modo más peculiar y con él consiguen diminutivos y aumentativos análogos a los castellanos terminados en ito y azo, respectivamente. Para estos fines, en los primeros cambian la consonante dura en suave, ne los segundos añaden al substantivo la partcula *rke* (ərke) v. gr.: *fótəm hijo, fochəm hijito; domo mujer, fomo mujercita; duam negocio, fuam favor. Trewa perro, trewarke perrazo, üñəm, üñəmərke pajarazo*, etc.'

https://doi.org/10.1017/S002222672500012X Published online by Cambridge University Press

Table 18. Sample alternating forms in Lehmann-Nietsche's texts (Malvestitti 2012)

Spelling	Sound	Elsewhere as	Gloss
<**sh**ayen>	[ʃajen]	[ʐ̩ajen]	'flower'
<wa**sh**ka**ll**>	[waʃkaʎ]	[waθa]+[kal̪]	'rattle (gourd+leather)'
<ke**sh**u>	[keʃu]	[kesu]	'cheese'<Spanish /keso/
<üä**s**'a, we**d**a, we**θ**a>	[wɛʃa, weða, weθa]	[weθa]	'bad'
<**t**'okikelu>	[t̪okikelu]	[toki-ke-lu]	'who is being a leader'
<me**t**'e>	[met̪e]	[met̪e]	'too much'
<ko**ll**ü>	[koʎɨ]	[kolɨ]	'tan' (here a variety of horse)
<pu**ll**ku>	[puʎku]	[pulku]	'alcoholic drink'
<ü**ll**cha, ü**l**cha>	[ɨʎt͡ʃa, ɨl͡ʃa]	[ɨʎt͡ʃa]	'maiden, heavenly maiden'
<**t**'a**l**'ka>	[t̪al̪ka]	[ʈ̩alka]	'rifle'
<mo**ch**i>	[mot͡ʃi]	[mot͡ʂi]	'(nice and) fat'
<lam**ñ**en>	[lamɲen]	[lamŋen]	'sister' (in a seductive song)
<lam**n**'en>	[lamn̪en]	[lamŋen]	'sister' (disdainful greeting)

a careful attempt at phonetic transcription. This evidences substantial sub-phonemic alternations, including the kinds of affective phenomena we see to the west of the Andes, as shown in Table 18.

The most surprising item here is the case of 'sister' where the palatalisation and dentalisation appear to affect the velar nasal, against the more general pattern that is circumscribed to coronals. While we have seen that this alternation is observed – albeit very sporadically – in contemporary eastern varieties (Díaz-Fernández 2007, Section 2.3), we note that Lehmann-Nitsche's data give no suggestion of the process affecting labials, as in present-day Chubut. We turn to the implications of this in Section 6.3.

Summing up, while the historical record shows affective alternations to be elusive for corpus analysis, due to written-language ideologies, the patterns described for contemporary Mapudungun appear to peak out at different key points, both in the metalinguistic commentary and in sporadic orthographic representation. On the one hand, the categorical differences in the coronal articulations are difficult for non-native speakers to perceive, as evidenced in particular by the case of the late identification of contrast between dental and alveolar stops. On the other hand, standard language ideologies conspire against representing contextual alternations, so the more the language is written – especially by native speakers – the more conventionalised it becomes.[37] We have seen, however, that some forms appear to lexicalise the affective alternant (recall [ʃakiŋ] 'respect' from [ʐ̩akin] 'think'), while others seem to lose their more evocative or iconic forms as their meanings become more conventionalised ([fuļ] 'thump' vs. [fu**l**-] 'dump').

4. Affective alternations in the morphology

Catrileo (1986: 12) makes the explicit comparison between the toggling of affective values permitted by Mapudungun coronal alternations and the same semantico-pragmatic effects

[37] Additionally, documentation does not always favour the representation of these features, as argued by Ponsonnet (2018a)

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resulting from the morphology in other languages. The most obvious comparison here is between diminutives and palatalisation, as already suggested starting from the eighteenth century. So we find [fo͡ʧɨm] (elsewhere [fo̱ɨm]) often glossing the Spanish *hij-it-o* 'child-DIM-M'. In most cases, however, a lexical item is also available, such as [pɨ̱͡ʧi] 'small' in [pɨ̱͡ʧi ʂ̱͡ewa] 'little dog' glossing Spanish *perr-ito* 'doggy'. In such cases, furthermore, the target word need not undergo the consonantal alternation (i.e. here [ʂ̱͡ewa] does not palatalise to [ʧ͡ewa]).

Since size is the most concrete or explicit meaning of diminutives, it is unsurprising such forms are easier to elicit, and that the written record for Mapudungun reflects them either through lexical resources or palatalisation. The more pragmatic dimensions of diminution, including politeness, epistemic uncertainty, affective proximity, sarcasm, etc. (see Ponsonnet 2018b, Rose 2018, Guillaume 2018), are far less likely to be conveyed by lexical resources. The pragmatic palatalisations, furthermore, may not make it into the written record and they will be less easily elicited out of context.

For dentalisation, there seems to be no transparent link to what in other languages might be explicitly sized-based augmentative morphology (e.g. Spanish: *-ote, -ota, -azo, -aza, -ón, -ona*). There is some evidence for this potentially being the case etymologically, in words referring to inherently large things or quantities, like [a**l̪**i] '(too) much', [mɨ**t̪**e] 'much/many', or [fe**n̪̪t̪**e] 'so much'; however, the forms seem highly lexicalised (cf. Table 7, Section 6.3). This lack of a synchronically transparent size-based augmentative means that the dentalisation processes are much more subtle overall, encapsulating more pragmatic functions associated to augmentation, such as deference, disapproval, abruptness, distance, or disdain (see Ponsonnet 2018b for a cross-linguistic overview), hence difficult to elicit.

With this in mind, we may turn to ask whether coronal alternations might become fixed not only at the word level but also at the level of the affixal morphology of the language. Indeed, there seem to be a handful of suffixes within the language's large repertoire (over 100 in Smeets' 2008 grammar) that have clear connotations akin to those we find in the usage described by Catrileo and evidenced in the corpus data for consonant alternation.

4.1. Diminutive [-ɨʎ]

While not a productive suffix in present-day Mapudungun, word-final [-ɨʎ] – termed APPRECIATIVE DIMINUTIVE by Villena, Cabré & Fernández-Silva (2019) – is common in words that seem to refer explicitly small-sized referents, especially when compared to their non-suffixed counterparts. These relationships can be seen in Table 19, based on entries from Augusta's dictionary (1916). Interestingly, the diminutive semantics of the suffix seems to go hand in hand with the presence of a palatal lateral, in line with the more general process in the language, even though it appears to be restricted to the suffix (note the lack of palatalisation of the medial coronal fricative in *fo**d**üll* 'pit/stone').[38]

[38] A candidate for the same process or even the same suffix is the form <pchillu> in Valdivia's 1606 grammar, which is glossed as *poquito* 'a little bit', where the root is clearly [pɨ͡ʧi] 'small'. Another case might be the word for 'elbow' [chunil], also in Valdivia (compare Augusta *chunui, chunuyküley*,and *chunuykünuwün*). See also Pache (2014: 352-4.) regarding the origins of [-(ɨ)ʎ].

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Table 19. Words ending in <üll> ([-ɨʎ]) and possible base forms in Augusta (1916)

Suffixed word		Gloss	Proposed base		Gloss
<changüll>	[t͡ʃaŋɨʎ]	'finger'	<chang>	[t͡ʃaŋ]	'leg, branch'
<añapüll>	[aɲapɨʎ]	'shrunken person, dwarf'	<añay>	[aɲaj]	'friend'
<pangküll>	[paŋkɨʎ]	'puma cub'	<pangi>	[paŋi]	'puma'
<fodüll>	[foθɨʎ]	'(fruit) pit/stone'	<fodo/foro>	[foθo/foʐo]	'bone'
<kowüll>	[kowɨʎ]	'watery fruit (zabala fruit)'	<ko>	[ko]	'water'
<kufüll>	[kufɨʎ]	'shellfish'	<kuf>	[kuf]	'bloated/ empty'
<wimüll>	[wimɨʎ]	'thin rod' (Febrés 1765)	<wima>	[wima]	'rod'

4.2. The evidential [-(ɨ)ʐke]/[-(ɨ)θke]

Already in his eighteenth-century grammar, Havestadt notes that the evidential suffix [-ʐke] alternates *ad libitum* ('freely') with [-ðke], [-ske], and [-ʒke] (1777: 103). Contemporary grammars and studies (Salas 1992; Zúñiga 2003, 2006; Hasler 2012; Hasler, Olate & Soto 2020), referring to the retroflex form [-(ɨ)ʐke], describe the morpheme as an evidential, with two main roles: reportative/inferential (REP) and perceptual/admirative (ADM), which I exemplify in (7).[39]

(7) a. *kiɲe ʐupat͡ʃi kiɲe domo kalko-**ʐke** nie-**ʐke**-fu-j al ɨn piɲeɲ.*
one occasion one woman witch-ADM have-REP-RI-IND.3 much child
'One time, a woman who turned out to be a witch, it is said had many children.'
(Salas 1992: 269)

b. *tɨfat͡ʃi t͡ʂewa-**ʐke** amta waŋki-waŋki-ŋe-j kom pu?*
this dog-ADM PART bark-bark-VBLZ-IND.3 all night
'This dog (which I see here) barked continually all night?'
(Augusta 1903: 327)

c. *maj, fej-**ɨʐke**, iɲt͡ʃe taji pe-fi-ɲ tɨfat͡ʃi t͡ʂewa.*
yes, 3-ADM 1s a.while.ago see-3.A-IND.1.S.P this dog
'Yes, that is it, I saw that dog (barking) a while ago.'
(Augusta 1903: 327)

The relationship between the two functions is fairly straightforward in that an element in the discourse which is worth the extra focus of the admirative is also worth highlighting to an interlocutor as something that has been reported to be of import or surprising (DeLancey 1997). The further link to the augmentative interpretation – given by Moesbach (1962) – is

[39] Glossing: 1: first person; 3: third person; A: agent; IND: indicative; RI: ruptured implicature (see Golluscio 2000); P: patient; PART: particle; S: singular; VBLZ: verbaliser.

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also unsurprising, as these forms entail something which elicits an emotional or affective reaction, thus linking to an interpretation of the suffix as a form of evaluative morphology (Grandi & Körtvélyessy 2015).

Interestingly, the earliest attestations of the suffix in Valdivia (1606, 1621) show exclusively <dque> ([-ðke]) spellings, while contemporary usage strongly favours <-rke> ([-zke]). The early forms, exemplified in (8) appear to be of the admirative type, much as in (7b, c), appearing always in a contrastive context. In Valdivia's sermons (1621), the suffix surfaces in particularly exalted sections, usually speaking to God directly, as in <geuelay ta ca dùgu ta vfchivalu, eymi**d**que> 'there is no other thing worthy of adoration, you alone'.

(8) a. <quiñe-dque> one-ADM 'each one'
b. <Christo-dque> Christ-ADM 'Christ alone'
c. <eymi-dque> 2s-ADM 'you and no other'

While the exact diachronic path that this suffix might have taken is unclear, there seems to be an early tendency for the emphasis – the mirative meaning – to share the phonological marker of pejoration or rudeness, showing perhaps the abruptness of a change in focus (see Yliniemi 2021) or, indeed, an original augmentative meaning. In any case, the [-ðke] form certainly aligns with the more general semantico-pragmatic connotations of dentalisation, to wit, the strong affective involvement placed upon the form. The apparent loss of the phonological exponent in more recent corpus attestation may be seen as a mark of the broadening of the meaning of the suffix or simply a case of our data becoming more conventionalised (though see Augusta's 1934 examples in Section 3.2.1).

4.3. The ineffectual [-piza]/[-piθa]

According to Moesbach (1962: 103), this modal suffix has pragmatic implications of futility, excess, or injustice of the action denoted (see also Zúñiga 2017: 700–701 and Hernández et al. 2006: 127), recoverable in (9).[40] It is also claimed to have a range of forms, including [-piθa], [pizą] and [piʃa].

(9) a. [kim-piθa-jafu-jmi]
know-INEF-COND-IND2S
'You would have known anyways' (Moesbach 1962: 103)
b. [amu-piθa-n]
go-INEF-IND1S
'I went there to no avail' (Hernández et al. 2006: 127)
c. [puw-il-uw-piθa-jmi]
go.there-CAUS-REFLEX-INEF-IND2S
'You defend yourself in vain' (Coña 1930: 207)
d. [iʎku-tu-pizą-n]
anger-VBLZ-INEF-IND1S

[40] These examples are all from sources using fairly distinct orthographic conventions; however, in all cases, this usage is explicitly stated by the authors, thus allowing me a fairly solid mapping onto IPA characters. While generally phonemic in nature, I have given the transcriptions in square brackets to show that, particularly in the 'affective' alternations, these are not meant to represent underlying representations.

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‘I became angry with someone for no reason’ (Augusta 1916)

As with [-ʐke], the basic meaning of the suffix seems to enclose the idea of a rejection of another state of affairs and perhaps a degree of frustration, which correlates with the use of the dental fricative. Given the forms with [ʐ], we may assume that the retroflex is its neutral realisation, at least etymologically. As a verbal root, [pɨʐa] has the meaning ‘ascend/mount’, which may entail the idea of effort, while the dentalisation entails a displeasure or sarcastic attitude towards these attempts, ultimately morphologising into the frustrative or inefectual semantics of the suffix.

All in all, it seems that the alternations in suffixal forms can be independent from overall alternations in the phonology (i.e. non-palatalised/dentalised coronals appear in the root). However, semantics or pragmatics of the relevant suffixes, appear to be supported by the meaning of the consonantal shift (diminution/pejoration/admiration). The exact diachronic path by which this would have come to pass is unclear. On the one hand, it is possible that the suffixes would have acquired the affective connotations and the concomitant articulations as the result of being attached to words which often underwent these processes. Conversely, the general semantics of the suffixes could have attracted the same processes as roots, independent of the roots themselves, eventually morphologising to varying degrees.

5. Coronal alternations and sound-symbolic behaviour

The spotted hawk swoops by and accuses me,
he complains of my gab and my loitering.
I too am not a bit tamed, I too am untranslatable,
I sound my barbaric yawp over the roofs of the world.
W. Whitman, *Song of Myself*, Section 52

Sound-symbolism is the general principle by which meaning can be more or less directly mapped on to phonic substance.[41] As such, it subverts the more widespread principle of the arbitrariness of the Saussurean sign, narrowing the gap between signifier and signified (cf. de Saussure 1916/1957, Joseph 2024). While languages and cultures vary in their reliance on them, sound-symbolic items and processes are by no means rare (Dingemanse 2018). Sound-symbolic behaviour, furthermore, is on a cline with fully conventionalised (read: arbitrary) spoken-language behaviour and shows substantial contextual variation (i.e. ‘pluripotentiality’ in the sense of Winter et al. 2021). Hence, on one pole are fully involuntary vocal expressions of a speaker’s internal state[42] – Whitman’s actual ‘barbaric yawp’ – which Dingemanse (2023) and Winter, Woodin & Perlman (in press: 24) point out are reactive and not iconic in nature so may be best treated as outside the realm of ‘symbolism’ proper. On the other pole are items fully dissociated from their referent – words such as *roofs* or *accuses* – which are straightforwardly arbitrary. In-between the two poles lie more clearly imitative, onomatopoeic elements – the word *yawp* – and conventionalised ‘phonaestemes’ such as the /sw/ cluster in *swoop*,

[41] In Sapir’s formulation, sound symbolism is ‘the expressively symbolic character of sounds quite aside from what the words in which they occur mean in a referential sense’ (1929: 225). Similarly, Knoeferle defines it as ‘the non-arbitrary mappings that exist between phonetic properties of labels and perceptual properties of their referents’ (2017: 1).

[42] These expressions are problematically termed ‘corporeal sound symbolism’ by Hinton et al. (1994: 2).

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conveying swift movement (compare *swing*, *swish*, *swat*, etc. – see Kwon & Round 2015). While the first of these clearly stand in a resemblance relationship between sound and meaning (*iconicity*), the latter have a systematic, sub-lexical correspondence to meaning, which, nevertheless, is not as transparently mapped to aspects of their referent (Winter et al. in press).

Key to our later discussion is the category of 'synaesthetic' sound-symbolic elements, which Hinton et al. (1994: 4) consider to be the 'acoustic symbolisation of non-acoustic phenomena'. An example of this might be simulating spatial extension by using vowel length, as in a recitation of Whitman's poem with an elongated form or the word *w-o-o-orld.* This type of iconicity is fairly transparent and often claimed to be universal, as are the uses of high pitch for small things and low pitch for large ones (cf. Ohala 1994, Winter & Perlman 2021, Akita et al. 2024). However, such sound-symbolic phenomena are prone to become conventional (Hinton et al. 1994: 4), hence acquire language-specific patterns, which no longer map as directly to the physical properties of the referent, even if they are cognitively real for speakers (as in the /sw/ cases, above).

Another important observation in the field of sound symbolism is that elements that fall in this domain may vary between more direct attempts to represent the sounds associated to the referent – which transgress the structural features of the linguistic system – and attempts to represent those sounds more conventionally, using the resources already available within the language. Rhodes (1994) refers to the first group of as 'wild' forms and the second as 'tame' ones. Among 'wild' usage we might count the use of ejectives in non-ejective languages to denote exasperation or disapproval ([stɒpʼ] 'stop!') or the use of snorts to imitate a pig's vocalisations. Note that while both these options are available to English speakers, they may also use phonologically 'tame' forms like *stop!* [stɒp] or *oink* [ɔ̃jŋk] to similar ends. In other languages, matters seem to be somewhere in between, with a clear subset of 'expressive' phonic elements available as an extended sound inventory for the language (see Silverstein 1994 and Sapir 1911 for examples of this in Waco-Wishan and see Nuckolls et al. 2016 for Pastanza Quichua).

5.1. Size symbolism and the 'Frequency Code'

Although it shows different degrees of conventionality, a cross-linguistically well-established synaesthetic tendency is the correlation of vowel height and physical size of the referent: high front vowels relate to small things and back vowels to large ones (Sapir 1929, Ohala 1984, Shinohara & Kawahara 2010, Akinbo 2021).[43] This is seen, in particular, by the presence of high front vowels in the vast majority of diminutive markers found across languages (over 90% for the sample in Ultan 1978). Closely related, the link between palatal consonants and diminution – with concomitant positive affect – has long been recognised as a sound-symbolic one (Nichols 1971, Alderete & Kochetov 2017). As we shall see, however, the opposite associations, related to 'large' size have a less predictable segmental correspondence.

A systematisation of these kinds of sound-size relations was proposed by Ohala (1984, 1994) as the 'Frequency Code', which observes that sounds with a higher acoustic frequency correlate to small things and sounds with lower frequency correlate with large things. This pattern may be realised suprasegmentally (via tone) or segmentally (via vowels and

[43] Although see Diffloth (1994) for a reversal of this pattern in the Mon-Khmer language Bahnar.

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Table 20. Suprasegmental and segmental predictions of the 'Frequency Code' (Ohala 1994: 335). *For consonants, the frequency differential refers to bursts, frication noise, and/or formant transitions

'small/sharp/fast'	'large/soft/slow'
high tones	low tones
high F2 vowels	low F2 vowels
higher frequency consonants*	lower frequency consonants*

consonants), as summarised in Table 20. Crucially, for Ohala these patterns are ethologically based; that is, they result from advantageous evolutionary adaptations. This is visible in other species, where body size correlates to differences in fundamental frequency of the emitter of the sound and becomes linked to aggression and submission. This does not mean that a universal linguistic equivalence is expected but that there is an underlying bias towards these associations. Indeed, in experimental settings, perceptual size-to-frequency correspondences were first identified nearly 100 years ago (Sapir 1929) and continue to be corroborated today (see Lockwood & Dingemanse 2015 and Knoeferle et al. 2017 for a review and more recent evidence).

In cases of strict size symbolism, the consonantal pattern seems to hold well, as in the case of Wishram in the description by Sapir (1911), where fortis consonants (higher F2) represent diminution and lenis consonants (lower F2) represent augmentation. The claimed extension of these frequency-code patterns to domains, such as general affect and politeness, are more problematic. In a recent paper, Winter et al. (2021) find that these biologically rooted explanations fall apart where there is more cultural embeddedness of the relevant expressive function. Ultimately, frequency (fundamental or otherwise) can be put to a variety of linguistic uses, making the more basic size-based associations opaque, even if retrievable in certain experimental contexts.

5.2. Sound symbolism and the Mapudungun coronal alternation

Given the well-established link between palatalisation and diminution, explaining the Mapudungun phenomena discussed in this paper as cases of straightforward sound symbolism is tempting. While we do indeed see clear evidence for the use of iconic resources more broadly — and frequency more narrowly – in the expressive alternants of Mapudungun coronals, it is also true that these patterns are highly mediated both by contextual semantics and by phonological structure.

We have seen that although palatalisation is occasionally used to express the literal (small) size of the referent, this is only one of the ranges of its meanings, which include pragmatic operations to do with approval, politeness, or deference. Conversely, dentalisation is rarely used as a means to express (large) size, even though dentals are found in non-alternating words with the meaning 'much' or 'big' (see Table 7). Far more common are dentals' broad range of pragmatic implications to do with rudeness, deprecation, pejoration, disgust, and general distancing. Indeed, while there are some cross-linguistic tendencies for morphological diminution and augmentation to have an extended range of meanings of this

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type, these may be very culturally specific and unpredictable (Ponsonnet 2018b). With this in mind, any direct iconic links that might be proposed between dentals and augmentatives are not particularly transparent regarding 'largeness', weakening the explanatory power of size-based sound symbolism, at least for the synchronic grammar of Mapudungun and particularly for dentalisation therein.[44]

As for the sound structure itself, given Ohala's (1994) claims that consonants with higher F2 in bursts, frication, or transitions correlate to small size, it is not surprising to see palatals, with the overall highest F2 transitions by place of articulation (cf. e.g. Nirgianaki 2014; Tabain, Kochetov & Beare 2020), as the prime candidates for diminution (see also Alderete & Kochetov 2017). Following this same metric, we would expect that consonants with the lowest F2 transitions – velars and labials – would make for the ideal loci for representing large size, rather than dentals. Indeed, as Ohala himself claims, the biggest consonantal place opposition we might expect regarding the frequency code would be between coronals and non-coronals (1994: 335).The fact that this is not the case for Mapudungun aligns with a number of studies where the frequency code does not seem to be clearly borne out in the grammar of individual languages, especially for the 'large' end of the scale (cf. Diffloth 1994; Bauer 1996; Haynie, Bowern & LaPalombara 2014).[45]

Among coronals themselves, however, there does seem to be evidence for dentals being set apart, in particular by their low F2. Indeed, recent phonetic work on the dental-alveolar opposition in Mapudungun (Fasola et al. 2015, Figueroa et al. 2019) shows the main parameter distinguishing them is F2 at the onset of adjacent vowels, where dentals cause a greater depression than alveolars.[46] This is compatible with the kinds of results in Knoeferle et al. (2017), where lower F2 is statistically associated to the perception of larger size under laboratory conditions. Nonetheless, this fails to explain why non-coronals – with even lower F2 – do not participate in the purported iconic alternation.[47] In other words, if the frequency code does have any relevance to the 'large' end of size symbolism for Mapudungun, this is not fully phonetically transparent but is quite deeply embedded in the phonological system, such that the more transparent, non-coronal, low-frequency forms (labials and velars) are set aside in favour of coronal-internal lowest frequency (dentals). While this

[44] A reviewer suggests an interpretation of the Mapudungun facts (also mentioned by audiences at the 30th Manchester Phonology Meeting 30 and 25th International Conference on Historical Linguistics), such that the interdentals, insofar as they entail tongue protrusion, might be related to the 'tongue-out' gesture found in many cultures (e.g. in Maori warrior dance) to express 'rudeness, disgust, playfulness, or outright provocation'. While this is a tantalising possibility for rescuing an explicitly iconic meaning for the dentals, my consultant saw no particular link between gesture and sound in her own experience, and I have been unable to find any mention of this gesture as a cultural feature in the anthropological literature on the Mapuche. As a community outsider, and in the absence of broader cross-cultural evidence for the universality of the gesture, I hesitate to back such a claim.

[45] In a survey of 'smallness' and 'nearness' vocabulary in the languages of Australia, Haynie et al. (2014) find that back vowels and dorsals are not as strongly correlated with 'largeness' and 'distance' connotations as high front vowels and palatals are to the opposite traits.

[46] These two studies focus only on non-fricatives. As a reviewer suggests, closer phonetic inspection of the [θ]-[ʃ]-[s]-[ʒ] alternations may be quite revealing, as, cross-linguistically [ʃ] has a lower center of gravity in its frication noise than [θ]. This is, indeed, key future work, though outside the scope of this study. In Figueroa et al. (2019), the findings are statistically significant only for stops and laterals, a fact that is attributed to the smaller number of tokens available for the dental nasal.

[47] A good comparison for fricatives is the case of Greek, where, while the F2 in the initial transition from dentals to vowels is slightly lower than for alveolars and palatals (the highest), the F2 following labiodentals and velars are far lower (Nirgianaki, 2014).

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highlights the centrality of coronals in Mapudungun, it detracts from the idea of the frequency code as a domain-general size-iconic mechanism.

Summing up, then, while we do see evidence for some general sound-symbolic behaviour in the expressive coronal alternations of Mapudungun, these also show a high degree of conventionalised (Saussurean!) relations, both in their semantics and their phonology. Indeed, while we might conjecture a historical stage where dentalised forms were transparently associated to 'large' meanings, this pattern would be long lexicalised or morphologised (see Section 6.3) before the written record. There is, furthermore, no particularly compelling cross-linguistic evidence upon which we could assume that 'large size' is the typical meaning of augmentatives (Ponsonnet 2018b) or, indeed, the semantic origin of the dentalised forms. At least as likely is the conjecture that the dentalisations result from the paradigmatic extension of iconic palatalisation to a different laminal articulation, such that they mirror the (size-independant) semantic distinctions between diminutives and augmentatives, i.e. they appear to simply express the contrary of the meanings of the palatalisations.[48]

6. Formalisation

Seeing as how we have shown that the coronal alternations of Mapudungun cannot be simply characterised as iconic, sound-symbolic processes, divorced from broader structural aspects of the language, we now turn to asking exactly what kinds of structures should be at play and where in the grammar these processes should be placed.

6.1. Affective alternations in the phonology: A featural approach

Both the present-day and the historical Mapudungun data show that affective coronal alternations are not only principled in terms of their general meaning but also non-random in their phonological exponence. Structurally, the possibility of phonological computations such as our target alternations implies some kind of representations that facilitate them, grouping segments into natural classes. We therefore need to postulate a plausible set of features for the coronal consonants of Mapudungun and the geometry that supports them.

Excluding the easternmost (Argentinian) varieties, all the relevant expressive process are restricted to coronal place. As a result, it seems uncontroversial to posit that the coronal domain is of some structural relevance to the language. It is clear, furthermore, that there is a split within the coronals that relates to the possibility of carrying expressive meaning. We have shown that the alveolar and retroflex consonants are by and large expressively neutral, while the dentals and palatals are often expressive. We have also noted that alveolars and retroflexes share apical articulations in Mapudungun, while the dentals and palatals share laminal ones, so we assume that apicality/laminality is a key dimension of variation, much in the same way as it is for Arandic and other Pama-Nyungan languages of Australia (Fletcher & Butcher 2014). Finally, we know that there is also a distinction within the laminals, such that one group is anterior (the dentals) and associated to augmentational semantics, broadly construed, while the other is non-anterior (the palatals) and is associated to diminutive

[48] I thank an anonymous reviewer for this suggestion.

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Table 21. Contrast matrix for Mapudungun coronals

Coronal			
laminal		apical	
anterior	posterior	anterior	posterior
t̪	t͡ʃ	t	ʈ͡ʂ
θ	ʃ	(s)	ʐ
n̪	ɲ	n	
l̪	ʎ	l	

semantics. Similarly, the apicals show a contrastive difference between anterior alveolars and non-anterior retroflexes, particularly for the stops and fricatives. This leaves us with a series of hierarchically organised distinctions, as shown in Table 21.

Laminal-apical contrasts have long been argued to be fundamentally characterised by the feature [DISTRIBUTED] (Chomsky & Halle 1968, Clements 2009, Rice 2011), distinguishing dentals from alveolars and palatals from retroflexes. This pattern is surface-true for present-day Mapudungun stops, nasals, and laterals – where the contrast is indeed between laminals and apicals – however, the fricatives ([θ̪] vs. [ʂ]) display a different pattern. Here, /s/ is a recent borrowing and patterns with the apico-alveolars while not being phonetically apical itself (Sadowsky et al. 2013, Molineaux 2022). Given that there is no other well-established, phonetically grounded feature that might bring together /s,t,n,l/ in opposition to /θ, t̪,n̪,l̪/, we must contemplate the possibility that, while /s/ is phonologically in a natural class with the apical-alveolars, it lacks a clear one-to-one mapping to the phonetics. This suggests that the phonology operates here as an independent symbolic system, giving credence to substance-free approaches to phonology (Hale & Reiss 2000, Odden 2006, Iosad 2017).[49]

Adopting a unary feature analysis ([—] represents lack of specification at the relevant tier), a feature geometry for the Mapudungun coronals is given as Figure 2. Feature labels are provided for familiarity's sake, rather than for the strong implication that these are mapped on to articulatory or acoustic targets.

The hierarchical organisation of [DISTRIBUTED] over [ANTERIOR] is justified by the fact that both affective dentalisation and palatalisation must be the result of active processes, requiring a specified feature. The loss of the feature [ANTERIOR], in the case of palatalisation, cannot be effected by a feature that is not active itself. However, if the entire [DISTRIBUTED] node is replaced, then the dependent tiers (specified or not) may be inherited (see Section 6.2). This is in line with the more general assumption that, in acquisition, features are postulated by the learner to define a natural class that participates in contrast and alternations (Dresher 2009, Chabot 2022: 437).

[49] Contra Molineaux (2022), where a feature [STRIDENT] is proposed in order to specify /s/, I here argue that this segment's participation in the affective alternations requires a shared feature with /t,n,l/. Other possible explanations for the pattern, as suggested by a reviewer, are simply the phonological uniqueness of /s/ across language (e.g. its extrametricality, phonotactic patterning, and ability to mismatch between phonetic realisation and phonological category, as in the case of Panãra, as described by Lapierre (2023), where [s] patterns as a palatal, even though it is not phonetically palatal) or a more language-specific featural system for the language, in line with an Emergent Features approach, *à la* Mielke (2008).

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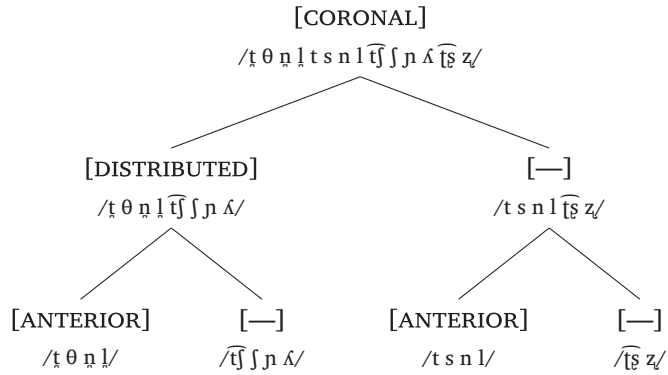

Figure 2. Proposed feature tree for Mapudungun coronal consonants.

6.2. Representation: Affective alternations as evaluative morphology

In our review of the Mapudungun materials, we noted that while amenable to a sound symbolic interpretation at a certain level of analysis, the affective alternations we have described often become lexicalised or morphologised, hence failing to alternate with the same contextual freedom. Here, I take this observation to its logical conclusion, which is that for speakers who have the key alternations active in their grammar, these can be treated as processes of morphological derivation of the evaluative type (typically diminutives, augmentatives, and related morphological elements; see Bauer 1997, Grandi & Körtvélyessy 2015, Merlini Barbaresi 2015), which have the range of semantic and pragmatic meanings described by Catrileo (1986, 2010).

A number of other phonic resources are known to convey emotion across languages but tend not to be considered a part of the morphological system. These include the modulation of pitch and volume or changes in speech rate and phonation type (see Besnier 1990). Such processes tend not to be circumscribed to individual lexical items or to be regularly productive, as the affective alternations are. They also tend not to have the kind of clear integration with the phonological system, which we see in the affective alternations of Mapudungun. Indeed, the phonology of the affective patterns seem to mirror what we find in concatenative morphological processes. Crucially, the alternations are not phonetically gradual but replace one contrastive segment of the language with another (see Section 2.2). Note, for comparison, that Mapudungun also has purely phonological palatalisation targeting alveolars in the context of preceding high vowels: /kim-fi-**n**/ → [kimfi**ɲ**] know-3OBJ-IND1S ‘I know them’ (see Molineaux in press).

Interestingly, however, the phonological processes involved in the affective alternations must be sub-segmental, consisting simply of the features necessary to convey the relevant affective alternation. This kind of pattern, where sub-segmental phonological alternations are used by speakers to convey affect, have been described for a number of languages, including Japanese (Mester & Itô 1989), Basque (Hualde 1991), Beja (Vanhove & Hamid Ahmed 2018), and Funguwa (Akinbo 2021). In such cases, the features themselves may be treated as the only phonological exponents of the relevant morpheme. These FLOATING FEATURES behave much in the same way as tone-only morphology does (cf. Clements &

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Ford 1979, Hyman 2011), in that they can be analysed as autosegmental in nature, without a pre-ordained segmental slot (see Akinlabi 1996 for an overview of tonal and non-tonal floating features). As such, they are computed at the same level of the grammar as other morphological processes, and interface with phonology in a similar manner to fully segmental morphemes. However, in this case, their presence is only perceptible by their effect on segmental material, where there is a suitable target for the feature (a coronal consonant).

Provided with this autosegmental architecture (*à la* Goldsmith 1976) and the feature geometry proposed in the previous subsection, the affective alternations are surprisingly simple in their representation. Positive affect is characterised by the presence of a diminutive floating morpheme with the feature [DISTRIBUTED], while negative affect requires an augmentative morpheme with both the feature [DISTRIBUTED] and the dependent feature [ANTERIOR], as in (10).

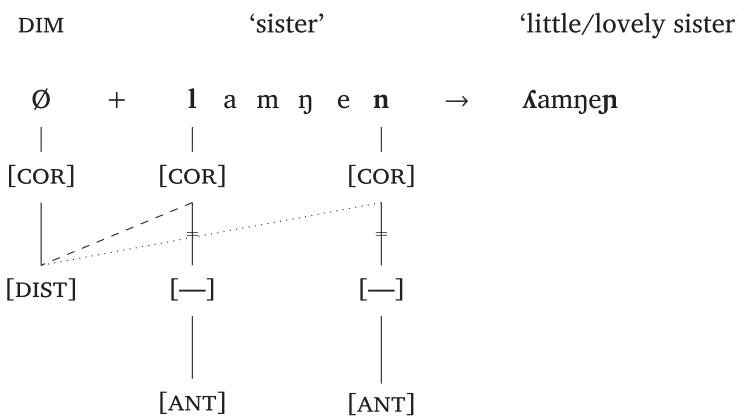
(10) Floating morphemes

a. *Diminutive (DIM)*

b. *Augmentative (AUG)*

Note that the featural tier below [DISTRIBUTED] is only specified for the augmentative. Indeed, in this system we assume that spreading of a feature entails spreading of any or no dependent features. Furthermore, given that the overall pattern we observed in Section 2.3 seems to affect coronals from left to right, with earlier coronals consistently affected and later ones less so, we assume that the floating morphemes attach to the left edge and spread rightwards to segments with a coronal node, as exemplified in (11) and (12). The number of affected segments after the first appears to present some speaker variation, hence the dotted lines in the figures, representing weaker links.

(11) Diminutive (DIM) feature spreading



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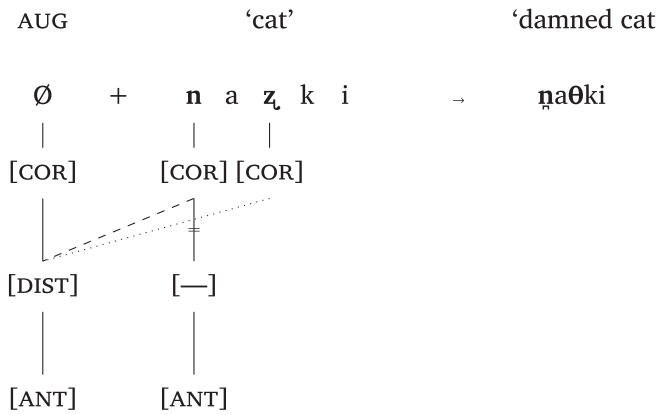
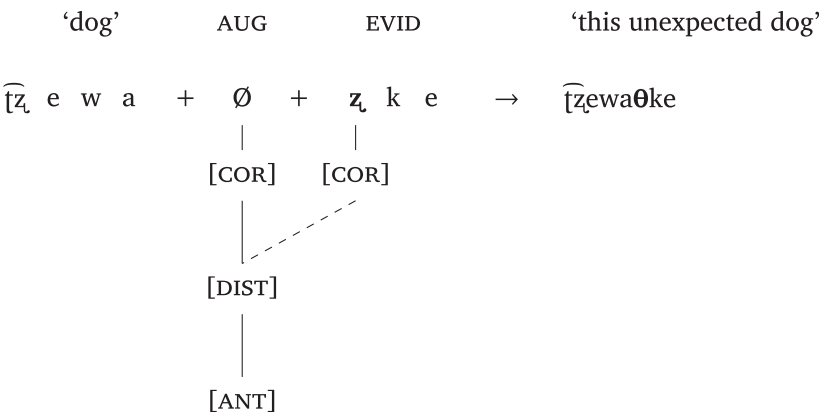
(12) Augmentative (AUG) feature spreading



While the process we suggest here predominantly affects lexical roots, some of the alternations are also found in affect-laden suffixes (particularly [-ʐ̩ke] and [-pɨʐ̩a], see Sections 4.2 and 4.3). It is not inconceivable that the floating morphemes can also attach to a subset of these suffixes, as exemplified in (13). We assume here that the floating feature attaches to the left and spreads rightwards, in line with what we have observed for roots. The possibility of attaching to these suffixes seems to be related to their specifically discourse-level functionality. Indeed, both the evidential ([-ʐ̩ke]) and the ineffectual ([-pɨʐ̩a]) seem to emphasise a surprising, noteworthy, or frustrating state of affairs, somewhat independent from the evaluation of root they attach to, hence the evaluative morphology is attached to this particular discourse element.[50]

(13) Feature spreading to suffixes



[50] An alternative approach to the autosegmental, floating-morpheme approach, as suggested by a reviewer, is to see the palatalisations and dentalisations as what has been termed by Inkelas (2014) 'process morphology'. This would entail that evaluative morphology does not have a concatenative structure in Mapudungun but is rather the phonological process itself which expresses the semantic/pragmatic meanings of augmentation and diminution. A full development of this approach is outwith the scope of this paper.

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An interesting potential corollary of this autosegmental analysis is an explanation for the fossilised 'dental harmony' that has been proposed for Mapudungun root morphemes (Campbell 2015, Bickel & Zúñiga 2017: 172). In brief, this proposal stems from the surprisingly common tendency for anterior coronals to share the same position of the active articulator within a lexical root, leading to the assumption of a consonantal harmony process (see Hansson 2010) that spreads dental articulations to alveolars or vice-versa (no attempts at formalisation exist for the Mapudungun data, to my knowledge). This leads to dental-only roots: [**t̪o̪l̪**] 'forehead', [**n̪ewe̪n̪**] 'strength', and [**l̪afke̪n̪**] 'sea' and alveolar-only ones: [**pi**l**ta**n-] 'tear apart', [**liɯɳe**n] 'silver', and [**so**n**i**] 'wrinkle'. While exceptions do exist – cf. [**n̪e**l-] 'let loose' and [**l̪ua**n] 'guanaco', in Augusta (1916) – the generalisation seems to hold and may indeed be stretched further to include all features below the coronal tier, such that, within a root morpheme, coronals will generally have the same specifications: cf. [**t͡ʃama**ʎ] 'shawl', [**ʎawfe**ɲ] 'shade', and [ko**s̻uz̻**]'toasted'.[51] While synchronically this is likely more of a fact about the structure of the lexicon, it is suggestive of the diachronic depth of these kinds of feature spreadings, independent of their current affective implications.

More generally, the patterns we have observed have striking reminiscences with other systems with pervasive laminal-apical distinctions, such as those we find among Australian languages. Within the Arandic sub-family of Pama-Nyungan, we see a direct parallel to the four coronal places of articulation of Mapudungun. In such languages, consonants are often organised as peripheral (labial and velar) vs. laminal (dental and palatal) vs. apical (alveolar and retroflex) (Fletcher & Butcher 2014). Still more interesting, we find that such languages are known to have special, socially marked registers where consonantal features are shifted in similar fashion to the affective forms of Mapudungun. For instance, Arandic 'baby talk' is a kind of child-directed speech where all coronal consonants are collapsed into laminal articulations (Turpin, Demuth & Campbell 2014), very much as in the affective forms of Mapudungun.[52] The patterns in both languages highlight speakers' ability to actively treat dentals and palatals as a natural category in a system of dense yet symmetrical coronal contrasts.

6.3. Affective alternations and language change

One of the most tantalising findings in our survey of affective alternation across time and space is that there is a tendency for Mapudungun varieties east of the Andes to have a broader application of the processes. Indeed, we see that, both in the materials for Chubut today (Díaz-Fernández 2007, Section 2.3) and from other historical Argentinian varieties registered by Lehmann-Nitsche (Malvestitti 2012, Table 19) the processes is not restricted to coronals but may affect velars and even labials. The examples in the early twentieth century data seem to affect velars both in terms of affective/diminutive palatalisation and pejorative

[51] There seems to be no restriction of nasals and laterals co-occurring with retroflexes, as there are no nasal and lateral retroflexes to fit the pattern: cf. [**z̻ali**] 'dish' and [**na͡s̻iŋ**] 'Solanum Gayanum (plant)'. More unexpectedly, the dental fricative seems not to have the same restrictions, particularly co-occurring with palatals: [**θuʎi-**] 'chose' and [**t͡ʃo͡θ**] 'yellow'. This further suggests the more fundamental link between segments sharing a [DISTRIBUTED] feature than an [ANTERIOR] one, as implied in our geometry.

[52] A similar pattern is documented for Walpiri, a related language, where baby talk collapses coronal consonants into the lamino-palatal series (Laughren 1984).

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Table 22. Lexicalisation of affective alternants

Category	Dental	Palatal
Productive alternation	t͡s̪ewa~t̪ewa ‘dog~damn dog’	t͡s̪ewa~t͡ʃewa ‘dog~doggy’
Long-term lexicalisation	al̪i ‘much’	pɨt͡ʃi ‘small’
	n̪aj ‘woe’	aʌa ‘pretty’
	mol̪- ‘be wrong’	ɲom- ‘be calm’
Recent lexicalisation	kal̪ku<kalku ‘wizard’	fiʃku<Sp.*fresko* ‘fresh/cool’
	poθ<poz̪ ‘dirty’	manʃun ‘ox’ <Sp.*manso* ‘tame’
Semantic split	ɨn̪un̪ ‘foul-tasting’~ ɨnun ‘hold water in the mouth’	ʃaki- ‘respect’~ z̪aki-‘think’
		weɲi ‘boy/child’~ weɲ̪uj ‘friend/trainee’
	kuθe ‘nasty old woman’~ kuz̪e ‘wife’	kuʃe ‘lovely old woman’~ kuz̪e ‘wife’

dentalisation. While, as we have argued, this is a morpho-phonological process rather than a purely phonological one, the change we see seems akin to what is described as rule simplification (King 1969) or rule generalisation (Kiparsky 1988, Bermúdez-Otero 2015) in phonology. In other words, the rule expands the environment for its application, such that the spread of the coronal features is no longer restricted to segments containing the feature coronal, but affects all consonantal place features (assuming the nineteenth-century data where labials and velars are affected). While this kind of process could very well be the result of regular sound change, the fact that the evidence points to more lexically sporadic effects, as well as changes in the domain of application (in Table 19 palatalisation/dentalisation affects only one of the consonants in [lamŋen]→[lamɲen]~[lamn̪en]), it may more broadly be classed as an analogical process, perhaps related to general language attrition and poor transmission of Puelmapu varieties (cf. Fernández-Garay 2002). In other words, it is more likely a result of the imperfect acquisition of the morphophonological rules suggested in Section 6.2.[53]

More generally, it is worth considering the matter of lexicalisation of the affective alternants in Mapudungun. Terms with strong implicit size or affect seem to display invariant patterns of dentalisation or palatalisation that have long histories. However, there are a number of items in which we have seen change to their affective semantics, at least partially as a result of cultural changes, becoming mostly invariant today. Finally, we have words where there appears to be a semantic split, such that the neutral and affected forms survive with clearly differentiated meanings. These (admittedly fuzzy) categories are exemplified in Table 22.[54]

[53] The limited data on these varieties only allow for fairly speculative accounts, of course, and other possibilities for the stochastic application of these patterns could be outlined. Among these, the Agreement-by-Correspondence framework, in harmonic OT grammars (see Rose & Walker 2004), is a strong candidate.

[54] Another interesting lexicalisation is the adverbial [mit͡ʃaj] ‘soon’, which comes fairly transparently from [mit̪e] ‘more’, in a future [-a], third-person form [-i], with a diminutive, politeness palatalisation: [mit̪e] > [mit͡ʃe]+[a] +[i] ‘it will be a bit more’ > [mit͡ʃaj] ‘soon’.

https://doi.org/10.1017/S002222672500012X Published online by Cambridge University Press

Table 23. A representative sample of kinship terms and terms of endearment/respect

Term	Relation
l̪aku	Paternal grandfather/grandchild (Namesake)
fɨ**t̪**a	Husband
fo**t̪**ɨm ∼ fo**t͡ʃ**ɨm	Son (of a man)
pa**l̪**u	Paternal aunt
mɨ**n̪**a	Cousin
n̪a**n̪**ɨŋ	Mother/daughter in law
t͡ʃaw	Father
ɲuke	Mother
pe**ɲ**i	Brother (of a man)
θeja	Sister (of a man)
lamŋe**n** ∼ **ʎ**amŋe**ɲ**	Sister of a man or sibling of a woman
ʎa**ʎ**a	Mother/son in law
t͡ʃe**θ**ki ∼ **t͡ʃ**e**t͡ʃ**e	Maternal grandfater/grandchild
t͡ʃu**t͡ʃ**u	Maternal grandmother/grandchild
ɲawe	Daughter (of a man)
ja**ʎ**	Offspring (of a man)
pɨ**ɲ**e**ɲ**	Offspring (of a woman)
ko**ɲ**i	Son (of a woman)
ŋe**n̪**	Owner/master
ko**n̪**a	Assistant
we**n̪**uj ∼ we**ɲ**i	Trainee/boy/friend
ɲa**ɲ**a	Close female friend (of a woman)
ka**t͡ʃ**ɨ	Partner/friend
mi**ʃ**a	Friends who share a meal
kompa**ɲ**	Travel companions <Sp:‘compañero’

A particularly interesting domain for the early lexicalisation category is that of kinship terms, as well as terms of respect and endearment in Mapudungun. Here, the vast majority of items have coronal consonants that are either dental or palatal, such that their random occurrence would be extremely unlikely. The general connotation of these terms is one of closeness and positive affect, or distance and respect, with a marked gender bias and generational asymmetry, as can be ascertained from Table 23 (based on Augusta 1916, Moesbach 1962, Zúñiga 2006). It seems that the coronal features of these words must have emerged from – or been reinforced by – the kinds of affective processes detailed above, becoming lexicalised at some historical depth long preceding the textual record.[55]

While the intricacies of the Mapudungun system of affective alternations are certainly unique, there is a long history of such patterns in languages of the Americas. Most significantly, Nichols (1971) surveys a rich and variegated series of systems of affective consonant shifts across languages of western North America. Given the phonological similarities she

[55] Further work is needed on the precise alignment of the diminutive/augmentative semantics of coronals and the specific significance of kinship relations in Mapuche culture.

https://doi.org/10.1017/S002222672500012X Published online by Cambridge University Press

uncovers across unrelated languages, she concludes that independent development is unlikely and, while a small subset of the languages may have developed the alternations, borrowing is a more likely source (1971:839). Where it did develop independently, one reason might be dialect borrowing, where the borrowed form has an alternate consonant and acquires a pejorative connotation. Another option is the existence of morpho-phonological alternations where the conditioning morpheme is lost. Be this as it may, the Mapudungun data do not seem to support any of these scenarios. Borrowing – at least recently – is unlikely, given the deeply entrenched nature of the alternations both in the lexicon and in the morpho-phonology (as argued in Section 3). Although parallels with Quechuan affective palatalisation is intriguing (de Reuse 1986, Halm 2020), dentals are not segments that are commonly found in the immediate linguistic neighbourhood, making the wholesale borrowing of the system less likely. Finally, the left-to-right nature of the spread also makes a vestigial morpheme analysis somewhat implausible, given the absence of prefixes in the language.

7. Conclusions

In this paper, we have attempted to shed some light on a phenomenon that inhabits the liminal spaces between phonology, morphology, pragmatics, and the lexicon of Mapudungun. This 'stylistic variation', Catrileo (2010) tells us, reflects speakers' language use within a particular context or frame of reference, and thus 'the researcher will struggle to obtain an exhaustive dataset if they lack an adequate command of the language they are attempting to describe' (52). It is therefore important that most of the observations made both for the contemporary and historical materials were the result of a process of shared reading with our native speaker consultant.

Despite the elusive nature of the alternations, our survey found a consistent thread of metalinguistic and corpus evidence for active processes of affect-driven palatalisation and dentalisation spanning from the earliest written records to the present day. Here, the orthographic material is somewhat impeded by lack of consistent representation of dental consonants (in opposition to alveolars) in the early period and then by reduction of alternative root spellings, due to incipient standardisation. Nevertheless, the contexts where we do find the alternations – both extralinguistic and linguistic – are remarkably consistent, rejecting the position that they represent unconditioned 'phoneme fluctuation'.

Palatalisation in Mapudungun generally conveys a constellation of meanings associated to diminution, including small size, proximity, approval, politeness, and tenderness, while dentalisation is associated to augmentation, including deference, distance, abruptness, disapproval, and harshness, only occasionally tied to explicitly large size. We have shown that, while speakers appear able to actively call upon these associations by effecting segmental changes, there are cases where the lexical meaning of the item is repeatedly aligned with the affective implication of the alternant. In such words, the shifted consonant becomes invariant, thus indistinguishable from its lexical representations. The result is that certain affect-laden areas of the lexicon tend to have substantially larger proportions of palatals and dentals than the rest of the language's vocabulary. In some cases, the unaffected form remains alongside the lexicalised affective form, creating new, true minimal pairs (see Table 23 and parallels in Nichols 1971: 830).

From a structural perspective, we have argued that the coronal alternations of Mapudungun are best treated as morphological processes, where dentalisation and palatalisation are

https://doi.org/10.1017/S002222672500012X Published online by Cambridge University Press

effected by rightward spreading of sub-phonemic floating morphemes in an autosegmental architecture. Starting at the left edge of the target morpheme, the relevant featural nodes dock on to the coronal consonants therein. In this context, the feature [DISTRIBUTED] was claimed to bring together all the affective processes and as such must be actively specified so that it can participate in the processes. The result of this is the higher ranking of [DISTRIBUTED] over [ANTERIOR] in our proposed feature hierarchy.

Finally, our data and analyses raise serious questions for a purely frequency-based sound-symbolic interpretation of Mapudungun consonantal alternations. We have shown that while the palatals conform to Ohala's (1984, 1994) predictions for size-based diminution, dentals are neither the ideal low-frequency targets for augmentation nor do they encompass the more canonical size-based semantics expected of such iconic mappings. Nevertheless, it seems very clear that, for native speakers, there is a non-trivial cognitive link between the laminal (dental and palatal) consonants and affect. These associations are both culturally and structurally embedded: They hold language-specific pragmatic readings and appear restricted to coronal places of articulation. The result is that, much in the same way as in Arandic baby talk, consonantal articulations realised with the tongue blade have a special status in Mapudungun, both structurally and semantically. Furthermore, what we have analysed as lexicalised, inherently affective forms doubtless contribute to this percept, since they provide ample evidence for learners of what may synchronically be seen as phonaestemic behaviour (recall /sw/-initial words in English, in Section 5).

The sound symbolic nature of the key Mapudungun processes is patently 'tame' in the sense of Rhodes (1994), demonstrating a high degree of cultural and structural embeddedness. Yet, as Catrileo points out, when a pronunciation 'differs from the usually accepted patterns for the occasion' (2010: 51), a stylistic or affective effect is produced. This is evocative of Diffloth's assertions about 'expressives' in Mon-Khmer, namely that 'the structural elements necessary for prosaic language are deliberately re-arranged and exploited for their iconic properties' (1979: 58). Thus, in Mapudungun, the 'affective' shifts do not produce new segments but repurpose the ones at hand just enough to convey their meaning. Indeed, alternants remain by and large within the coronal domain yet manage to 'differ from accepted patterns' sufficiently to trigger the evaluative interpretation.

While the diachronic route by which the language came to have affective coronal alternations is unclear, we see that these have left their mark on both the present-day lexicon and morpho-phonology. We can further trace such forms into the past suggesting an early lexicalisation of both size-related forms (recall [pi͡ʧi] 'small' and [a̠l̠i] 'much') and affect-prone domains (e.g. inherently good/bad, kinship and endearment terms, etc.). In the synchronic grammar, it is our claim that the series of behaviours encompassed by affective coronal alternations cannot be purely iconic but may be more parsimoniously subsumed within a robust, internally coherent series of morpho-phonological process where feature spreading conveys diminutive or augmentative semantics and their concomitant, language-specific pragmatic readings.

Acknowledgements. I would like to thank Fresia Loncon Antileo, whose intuitions and guidance made these analyses possible (*mañumeyu, Kimelfe!*). I'd also like to acknowledge the thorough and helpful comments I received from this journal's anonymous reviewers. They have much improved, in particular, the papers' claims (and my understanding) regarding sound symbolism and evaluative morphology.

https://doi.org/10.1017/S002222672500012X Published online by Cambridge University Press

References

Adelaar, Willem F. H. & Matthias Pache. 2023. Are all language isolates equal? the case of Mapudungun. In Thiago Costa Chacon, Nala H. Lee & W. D. L Silva (eds.), *Language change and linguistic diversity: Studies in honour of Lyle Campbel*, 164–186. Edinburgh: Edinburgh University Press.

Akinbo, Samuel. 2021. Featural affixation and sound symbolism in Fungwa. *Phonology* 38.4, 537–569.

Akinlabi, Akinbiyi. 1996. Featural affixation. *Journal of Linguistics* 32.2, 239–289.

Akita, Kimi, Bonnie McLean, Jiyeon Park & Arthur Lewis Thompson. 2024. Iconicity mediates semantic networks of sound symbolism. *Journal of the Acoustical Society of America* 155, 2687–2697.

Alderete, John & Alexei Kochetov. 2017. Integrating sound symbolism with core grammar: The case of expressive palatalization. *Language* 83.4, 731–766.

Antivero, Elena. 2019. Relaciones léxicas en la terminología de voces de animales en lengua mapuche. In Ana Fernández-Garay, Maria Soledad Pessi & Maria Soledad Regúnaga (eds.), *VI Jornadas de Investigación en Humanidades: homenaje a Cecilia Borel*, 1104–1109. Bahia Blanca, Argentina: Editorial de la Universidad Nacional del Sur.

Augusta, Félix José de. 1903. *Gramática araucana*. Valdivia, Chile: Imprenta Central J. Lampert.

Augusta, Félix José de. 1910. *Lecturas araucanas*. Padre Las Casas, Chile: Editorial San Francisco.

Augusta, Félix José de. 1916. *Diccionario araucano-español y español-araucano*. Santiago: Imprenta Universitaria.

Augusta, Félix José de. 1934. *Lecturas araucanas*, segunda edn. Padre Las Casas, Chile: Editorial San Francisco.

Barbará, Federico. 1879. *Manual ó vocabulario de la lengua pampa*. Buenos Aires, Argentina: Imprenta C. Casavalle.

Bauer, Laurie. 1996. No phonetic iconicity in evaluative morphology. *Studia Linguistica* 50.2, 189–206.

Bauer, Laurie. 1997. Evaluative morphology: In search of universals. *Studies in Language* 21.3, 533–575.

Bengoa, José. 2000. *Historia del pueblo mapuche (siglos XIX y XX)*. Santiago, Chile: Lom Ediciones.

Bermúdez-Otero, Ricardo. 2015. Amphichronic explanation and the life cycle of phonological processes. In Patrick Honeybone & Joseph Salmons (eds.), *The Oxford handbook of historical phonology*, 364–399. Oxford: Oxford University Press.

Besnier, Niko. 1990. Language and affect. *Annual Review of Anthropology* 19, 419–451.

Bickel, Balthasar & Fernando Zúñiga. 2017. The 'word' in polysynthetic languages: Phonological and syntactic challenges. In Michael Fortescue, Marianne Mithun & Nicholas Evans (eds.), *The Oxford handbook of polysynthesis*, 158–185. Oxford: Oxford University Press.

Campbell, Hugo. 2015. Chumngelu am müley ta in trürümael ti Mapuche az wirikünun? ¿por qué necesitamos normalizar la ortografía mapuche? *III Congreso de Lenguas Indígenas de Chile.*

Cañumil, Tulio. 2011. *Estudio del idioma mapuche = mapucezugun ñi gvnezuam*. Florencio Varela, Argentina: Xalkan.

Catrileo, María. 1986. La variación estilística en el nivel fonológico del mapundungn. *Revista de Lingüística Teórica y Aplicada* 2, 1–19.

Catrileo, María. 2010. *La lengua mapuche en el siglo XXI*. Valdivia, Chile: Facultad de Filosofía y Humanidades, Universidad Austral de Chile.

Catrileo, María. 2022. La importancia de los enunciados simbólicos en la mantención del mapudungun en Chile. *Estudios Filológicos* 70, 121–137.

Chabot, Alex. 2022. On substance and Substance-Free Phonology: Where we are at and where we are going. *Canadian Journal of Linguistics* 67.4, 429–443.

Chomsky, Noam & Morris Halle. 1968. *The sound pattern of English*. New York: Harper & and Row.

Clairis, Christos. 1991. Identification et typologie des fluctuations. *Bulletin de la Société de Linguistique de Paris* 861, 19–35.

Clements, George Nicholas. 2003. Feature economy in sound systems. *Phonology* 20.3, 441–465.

Clements, George Nicholas. 2009. The role of features in phonological inventories. In Eric Raimy & Charles E. Cairns (eds.), *Contemporary views on architecture and representations in phonology*, 19–68. Cambridge, MA: MIT Press.

Clements, George Nicholas & Kevin C. Ford. 1979. Kikuyu tone shift and its synchronic consequences. *Linguistic Inquiry* 10.2, 179–210.

Coña, Pascual. 1930. *Vida y costumbre de los indígenas araucanos en la segunda mitad del siglo XIX*. Santiago, Chile: Imprenta Universitaria.

https://doi.org/10.1017/S002222672500012X Published online by Cambridge University Press

Course, Magnus. 2011. *Becoming Mapuche: Person and ritual in indigenous Chile*. Champaign, IL: University of Illinois Press.

Croese, Robert. 1980. Estudio dialectológico del mapuche. *Estudios Filológicos* 15, 7–38.

Cuskley, Christine & Simon Kirby. 2013. Synaesthesia, cross-modality and language evolution. In J, Simner & E. M. Hubbard (eds.), *The Oxford handbook of synesthesia*, 869–907. Oxford University Press.

DeLancey, Scott. 1997. Mirativity: The grammatical marking of unexpected information. *Linguistic Typology* 1.1, 33–52.

Díaz-Fernández, Antonio. 2007. Estilemas en variedades del mapuzungun y en el español de los mapuches del norte de la provincia de Chubut. In Ana Fernández-Garay & Marisa Malvestitti (eds.), *Estudios lingüísticos y socio-lingüísticos de lenguas amenazadas de Argentina*, 73–87. Santa Rosa, Argentina: Universidad Nacional de La Pampa.

Diffloth, Gérard. 1979. Expressive phonology and prosaic phonology in Mon-Khmer. In Theraphan L. Thongkum (ed.), *Studies in Mon-Khmer and Thai phonology and phonetics in honor of E. Henderson*, 49–59. Bangkok, Thailand: Chulalongkorn University Press.

Diffloth, Gérard. 1994. i: big, a: small. In Leanne Hinton, Johanna Nichols & John Ohala (eds.), *Sound symbolism*, 107–114. Cambridge University Press.

Dingemanse, Mark. 2018. Redrawing the margins of language: Lessons from research on ideophones. *Glossa: A Journal of General Linguistics* 3.1, 1–30.

Dingemanse, Mark. 2023. Ideophones. In Eva van Lier (ed.), *The Oxford handbook of word classes*, 466–476. Oxford University Press.

Dingemanse, Mark, Damián Blasi, Gary Lupyan, Morten Christiansen & Padraic Monaghan. 2015. Arbitrariness, iconicity, and systematicity in language. *Trends in Cognitive Sciences* 19. 603–615. doi:10.1016/j.tics.2015.07.013.

Dingemanse, Mark, Will Schuerman, Eva Reinisch, Sylvia Tufvesson & Holger Mitterer. 2016. What sound symbolism can and cannot do: testing the iconicity of ideophones from five languages. *Language* 92.2, 117–133.

Dresher, B. Elan. 2009. *The contrastive hierarchy in phonology*. Cambridge: Cambridge University Press.

Dressler, Wolfgang & Lavinia Merlini Barbaresi. 1994. *Morphopragmatics*. Berlin: Mouton de Gruyter.

Eberhard, David M., Gary F. Simons & Charles D. Fennig (eds.). 2024. *Ethnologue: Languages of the world*. Dallas: SIL International. http://www.ethnologue.com (accessed 28 November 2024).

Echeverría, Sergio Max. 1964. Descripción fonológica del mapuche actual. *Boletín del Instituto de Filología de la Universidad de Chile* 25, 13–59.

Erize, Esteban. 1960. *Diccionario comentado mapuche-español*. Buenos Aires: Universidad Nacional del Sur.

Fasola, Carlos, Héctor Painequeo, Senghun Lee & Jeremy Perkins. 2015. Acoustic properties of the dental vs. alveolar contrast in Mapudungun. In The Scottish Consortium for ICPhS 2015 (ed.), *Proceedings of the 18th International Congress on Phonetic Sciences*, 1–5. Glasgow: University of Glasgow.

Febrés, Andrés. 1765. *Arte de la lengua general del Reyno de Chile*. Lima: Calle de la Encarnación. http://www.memoriachilena.gob.cl/602/w3-article-8486.html (accessed 28 November 2024).

Fernández-Garay, Ana. 2002. *Testimonio de los últimos ranqueles: Textos originales con traducción y notas lingüístico-etnográficas*. Buenos Aires: Instituto de Lingüística Facultad de Filosofía y Letras Universidad de Buenos Aires.

Figueroa, Mauricio, Héctor Painequeo, Camila Márquez, Gastón Salamanca & David Bertín. 2019. Evidencia del contraste interdental/alveolar en el mapudungun hablado en la costa: Un estudio acústico estadístico. *Onomazein* 44, 191–216.

Fletcher, Janet & Andrew Butcher. 2014. Sound patterns of Australian languages. In Harold Koch & Rachel Nordlinger (eds.), *The languages and linguistics of Australia: A comprehensive guide*, 91–138. Berlin & Boston: De Gruyter.

Goldsmith, John. 1976. *Autosegmental phonology*. Foreign languages and literatures dissertation, MIT.

Golluscio, Lucía. 2000. Rupturing implicature in the Mapudungun verbal system: The suffix *-fi*. *Journal of Pragmatics* 32, 239–263.

Grandi, Nicola & Lívia Körtvélyessy. 2015. Introduction: Why evaluative morphology. In Nicola Grandi & Lívia Körtvélyessy (eds.), *Edinburgh handbook of evaluative morphology*, 3–20. Edinburgh: Edinburgh University Press.

Guillaume, Antoine. 2018. The grammatical expression of emotions in Tacana and other Takanan languages. *Studies in Language* 42.1, 114–145.

Gundermann, Hans, Jaqueline Canihuan, Alejandro Clavería & Cesar Faúndez. 2011. El mapuzungun, una lengua en retroceso. *Atenea* 5.3, 111–131.

Hale, Mark & Charles Reiss. 2000. "Substance abuse" and "dysfunctionalism": Current trends in phonology. *Linguistic Inquiry* 31.1, 157–169.

Halm, Robert. 2020. Sound symbolism and the variation *ʃ *s *h in Proto-Quechuan. *International Journal of American Linguistics* 2, 201–236.

Hammarström, Harald, Robert Forkel, Martin Haspelmath & Sebastian Bank. 2024. *Glottolog 5.0*. Leipzig, Germany: Max Planck Institute for Evolutionary Anthropology. http://glottolog.org (accessed on 14 May 2024).

Hansson, Gunnar Ólafur. 2010. *Consonant harmony: Long-distance interactions in phonology.* Berkley, CA: University of California Press.

Hasler, Felipe. 2012. *El sistema de evidencialidad en mapudungun y sus transferencias al español mapuchizado*. M.A. thesis, Universidad de Chile.

Hasler, Felipe, Aldo Olate & Guillermo Soto. 2020. Origen y desarrollo del sistema evidencial del mapudungun. *Círculo de Lingüística Aplicada a la Comunicación* 81, 9–26.

Havestadt, Bernhard. 1777. *Chilidúgu: sieve tractatus linguæ chilensis*. Leipzig, Germany: Teubner.

Haynie, Hannah, Claire Bowern & Hannah LaPalombara. 2014. Sound symbolism in the languages of Australia. *PLoS ONE* 9.4, 1–16.

Herckmans, Elias. 1642. Vocabula Chilensia. In Rodolfo R. Schuller (1907) (ed.), *El vocabulario araucano de 1642–1643 con notas críticas i algunas aciciones a las bibliografías de la lengua mapuche*, 6–66. Santiago, Chile: Imprenta Cervantes.

Hernández, Arturo, Nelly Ramos & Rosa Huenchulaf. 2006. *Gramática básica de la lengua mapuche*, vol. 1. Temuco, Chile: Universidad Católica de Temuco.

Hinton, Leanne, Johanna Nichols & John Ohala. 1994. Introduction. In *Sound symbolism*, 1–14. Cambridge: Cambridge University Press.

Hualde, José Ignacio. 1991. *Basque phonology.* London: Routledge.

Hyman, Larry. 2011. Tone: Is it different? In John Goldsmith, Jason Riggle & Alan C. L. Yu (eds.), *The handbook of phonological theory*, 2nd edn. 197–239. Oxford: Blackwell.

INEC. 2005. Encuesta complementaria de pueblos indígenas (ECPI) 2004–2005. Technical Report. Instituto Nacional de Estadísticas y Censos Buenos Aires. https://www.estadisticaciudad.gob.ar/pergamo/documento.php?ui=1&recno=1264&id=PERGAMO.1.1264 (accessed 09 April 2025).

Inkelas, Sharon. 2014. *The interplay of morphology and phonology.* Oxford: Oxford University Press.

Iosad, Pavel. 2017. *A substance-free framework for phonology: An analysis of the Breton dialect of Bothoa*. Edinburgh: Edinburg University Press.

Joseph, John. 2024. Saussure and iconicity: The ghost in the machine? In Olga Fischer, Kimi Akita & Pamela Perniss (eds.), *Oxford handbook of iconicity in language*. Oxford: Oxford University Press.

Jurafsky, Daniel. 1996. Universal tendencies in the semantics of the diminutive. *Language* 72.3, 533–578.

Kawahara, Shigeto. 2020. Sound symbolism and theoretical phonology. *Language and Linguistics Compass* 14, 1–17.

Key, Mary Ritchie. 1976. La fluctuación de fonemas en la teroía fonológica. *Revista Signos* 9.1, 138–143.

Key, Mary Ritchie. 1979. Phoneme fluctuation and minimal pairs in language change. In Mortéza Mahmoudian (ed.), *Linguistique fonctionnelle: débats et perspectives*, 305–310. Paris: Presses Universitaires de France.

Key, Mary Ritchie & Christos Clairis. 1976. Fuegian and Central South American language relationships. In *Actes du 42ème Congrès International des Américanistes*, vol. IV, 635–645.

King, Robert D. 1969. *Historical linguistics and generative grammar.* Englewood Cliffs, NJ: Prentice-Hall.

Kiparsky, Paul. 1988. Phonological change. In Frederick J. Newmeyer (ed.), *Linguistics: The Cambridge survey*, vol. 1, 363–415. Cambridge: Cambridge University Press.

Knoeferle, Klemens, Jixing Li, Emanuela Maggioni & Charles Spence. 2017. What drives sound symbolism? different acoustic cues underlie sound-size and sound-shape mappings. *Scientific Reports* 7.1, 5562. doi: 10.1038/s41598-017-05965-y.

Kwon, Nahyun & Erich Round. 2015. Phonaesthemes in morphological theory. *Morphology* 25.1, 1–27.

Lapierre, Myriam. 2023. The phonology of Panãra: A segmental analysis. *International Journal of American Linguistics* 89.2, 183–218.

Laughren, Mary. 1984. Walpiri baby talk. *Australian Journal of Linguistics* 4, 73–88.

Lenz, Rodolfo. 1897. *Estudios araucanos*. Santiago, Chile: Anales de la Universidad de Chile.

Lockwood, Gwilym & Mark Dingemanse. 2015. Iconicity in the lab: a review of behavioral, developmental, and neuroimaging research into sound-symbolism. *Frontiers in Psychology* 6, 1–14.

Loncon, Elisa. 2017. Políticas públicas de lengua y cultura aplicada al mapuzugun. In Isabel Aninat, Verónica Figueroa & Ricardo González (eds.), *El pueblo mapuche en el siglo XXI: Propuestas para un nuevo entendimiento entre culturas en Chile*, 375–404. Santiago, Chile: Centro de Estudios Públicos.
Malvestitti, Marisa. 2012. *Mongeleluchi zungu: Los textos araucanos documentados por Roberto Lehmann-Nitsche*. Berlin: Gebr Mann Verlag.
Manquilef, Manuel. 1911. *Comentarios del pueblo araucano I (la faz social)*, vol. II: *Revista de folklore Chileno.* Santiago, Chile: Imprenta Cervantes.
Manquilef, Manuel. 1914. *Comentarios del pueblo araucano II (jimnasia nacional – juegos, ejercicios y bailes)* (Anales e la Universidad CXXXIV). Santiago, Chile: Imprenta, Litografía y Encuadernación «Barcelona».
Martinet, André. 1983. Ce que n'est pas la phonologie. *Langue Française* 60, 6–13.
Merlini Barbaresi, Lavinia. 2015. Evaluative morphology and pragmatics. In Nicola Grandi & Lívia Körtvélyessy (eds.), *Edinburgh handbook of evaluative morphology*, 32–42. Edinburgh: Edinburg University Press.
Mester, Armin & Junko Itô. 1989. Feature predictability and underspecification: palatal prosody in Japanese mimetics. *Language* 65.2, 258–293.
Mielke, Jeff. 2008. *The emergence of distinctive features*. Oxford: Oxford University Press.
Moesbach, Ernesto Wilhelm de. 1962. *Idioma mapuche.* Padre Las Casas, Chile: Editorial San Francisco.
Molina, Juan Ignacio. 1795. *Compendio de la historica civil del Reyno de Chile*. Madrid: Imprenta de Sancha.
Molineaux, Benjamin. 2021. El Sermón en Lengua de Chile en el Corpus Histórico del Mapudungun: De texto colonial a texto digital. *Lenguas y Literaturas Indoamericanas* 23.2, 21–49.
Molineaux, Benjamin. 2022. The dental-alveolar contrast in Mapudungun: Loss, preservation and extension. *Linguistic Vanguard* 8.5, 661–675.
Molineaux, Benjamin. 2023. The Corpus of Historical Mapudungun: Morpho-phonological parsing and the history of a Native American language. *Corpora* 18.2, 175–191.
Molineaux, Benjamin. 2024. Source material for the Corpus of Historical Mapudungun (CHM). https://benmolineaux.github.io/bookshelf/en/ (accessed 28 November 2024).
Molineaux, Benjamin. in press. Mapudungun coronal consonants: A challenge for the Featurally Underspecified Lexicon? In Sandra Kotzor, Paula Fikkert & Allison Wetterlin (eds.), *Shaping phonological and morphological representations: Diachrony, acquisition and processing*. Oxford: Oxford University Press.
Molineaux, Benjamin. 2025. 'Phoneme fluctuation': Empirical and theoretical limitations. Ms., University of Edinburgh.
Molineaux, Benjamin & Vasileios Karaiskos. 2021. Corpus of historical mapudungun (version 1.0). The University of Edinburgh. http://www.amc-resources.lel.ed.ac.uk/CHM/ (accessed 28 November 2024).
Molineaux, Benjamin & Fresia Loncon. 2024. El *dugulun* (diálogo) y el *coyaghtun* (parlamento) en el *Arte* de Andrés Febrés (1756): Un legado para el mapudungun. *CUHSO: Cultura, Hombre y Sociedad* 34.1, 392–423.
Moran, Steven & Daniel McCloy. 2019. *Phoible 2.0*. Jena, Germany: Max Planck Institute for the Science of Human History. http://phoible.org (accessed 28 November 2024).
Nichols, Johanna. 1971. Diminutive consonant symbolism in Western North America. *Language* 47.4, 826–848.
Nirgianaki, Elina. 2014. Acoustic characteristics of Greek fricatives. *Journal of the Acoustical Society of America* 135.5, 2964–2976.
Nuckolls, Janis B., Joseph A. Stanley, Elizabeth Nielsen & Roseanna Hopper. 2016. The systematic stretching and contracting of ideophonic phonology in Pastanza Quichua. *International Journal of American Linguistics* 8.1, 95–116.
Odden, David. 2006. Phonology ex nihilo. Paper presented at the the Tromsø Phonology Project Group Meeting.
Ohala, John. 1984. An ethological perspective on common cross-language utilization of F0 of voice. *Phonetica* 41, 1–16.
Ohala, John. 1994. The frequency code underlies the sound-symbolic use of voice pitch. In *Sound symbolism*, 325–247. Cambridge: Cambridge University Press.
Pache, Matthias. 2014. Lexical evidence for Pre-Inca language contact of Mapudungun with Quechuan and Aymaran. *Journal of Language Contact* 7.2, 345–379.
Painequeo, Héctor, Gastón Salamanca & Manuel Jiménez. 2018. Estatus fonológico de los fonos interdentales [n], [l] y [t] en el mapudungun hablado en el sector costa, Budi, Región de la Araucanía, Chile. *Alpha* 46, 111–128.
Penny, Ralph. 2002. *A history of the Spanish language*, 2nd edn. Cambridge: Cambridge University Press.
Ponsonnet, Maïa. 2018a. Do linguistic properties influence expressive potential? The case of two Australian diminutives (Gunwinyguan family). *Anthropological Linguistics* 60.2, 157–190.
Ponsonnet, Maïa. 2018b. A preliminary typology of emotional connotations in morphological diminutives and augmentatives. *Studies in Language* 42.1, 17–50.

https://doi.org/10.1017/S002222672500012X Published online by Cambridge University Press

Pozo, Gabriel. 2018. Ocupación del territorio mapuche: Testimonios ed mapudungun, su "autores intelectuales" y el registro de araucanistas alemanes en Chile. In Héctor Mora & Mario Samaniego (eds.), *El pueblo mapuche en la pluma de los araucanistas*, 88–130. Santiago, Chile: Ocholibros.

de Reuse, William J. 1986. The lexicalization of sound symbolism in Santiago del Estero Quechua. *International Journal of American Linguistics* 52.1, 54–64.

Rhodes, Richard. 1994. Aural images. In Leanne Hinton, Johanna Nichols & John Ohala (eds.), *Sound symbolism*, 276–293. Cambridge: Cambridge University Press.

Rice, Keren. 2011. Consonantal place of articulation. In Mark van Oostendorp, Colin Ewen, Elizabeth Hume & Keren Rice (eds.), *Blackwell companion to phonology*, 1–31. Oxford: Wiley-Blackwell.

Rose, Françoise. 2018. Rise and fall of Mojeño diminutives across centuries. *Studies in Language* 42.1, 146–181.

Rose, Sharon & Rachel Walker. 2004. A typology of consonant agreement as correspondence. *Language* 80.3, 475–531.

Sadowsky, Scott, María José Aninao, María Isabel Cayunao & Paul Heggarty. 2015. Huilliche: Â¿geolecto del mapudungun o lengua propia? una mirada desde la fonética y la fonología de las consonantes. In Ana Fernández Garay & María Alejandra Regúnaga (eds.), *Lingüística indígena sudamericana*, 23–51. Buenos Aires: Facultad de Filosofía y Letras, Universidad de Buenos Aires.

Sadowsky, Scott, María José Aninao & Paul Heggarty. 2019. Sound comparisons: Mapudungun. https://soundcomparisons.com/Mapudungun (accessed 28 November 2024).

Sadowsky, Scott, Héctor Painequeo, Gastón Salamanca & Heriberto Avelino. 2013. Mapudungun. *Journal of the International Phonetic Association* 43.1, 87–96.

Salas, Adalberto. 1992. *El mapuche o araucano*. Madrid: MAPFRE.

Sapir, Edward. 1911. *Diminutive and augmentative consonantism in wishram*, 2010th edn. 243–262. Berlin & New York: De Gruyter Mouton. doi:10.1515/9783110851090.243.

Sapir, Edward. 1915. *Abnormal types of speech in Nootka* (Canada Geological Survey, memoir 62, anthropological series, 5). Government Printing Bureau.

Sapir, Edward. 1929. A study in phonetic symbolism. *Journal of Experimental Psychology* 12, 225–239.

de Saussure, Ferdinand. 1957. *Cours de linguistique générale [Course in general linguistics]*. Wade Baskin, trans. Glasgow: William Colins and Sons (Original work published 1916).

Shinohara, Kazuko & Shigeto Kawahara. 2010. A cross-linguistic study of sound symbolism: The images of size. *Berkley Linguistics Society* 36, 396–410.

Silverstein, Michael. 1994. Relative motivation in denotational and indexical sound symbolism of Wasco-Wishram Chinookan. In Leanne Hinton, Johanna Nichols & John Ohala (eds.), *Sound symbolism*, 40–61. Cambridge: Cambridge University Press.

Smeets, Ineke. 2008. *A grammar of Mapuche*. Berlin: Mouton de Gruyter.

Suárez, Jorge. 1959. The phonemes of an Araucanian dialect. *International Journal of American Linguistics* 25, 177–181.

Tabain, Marija, Alexei Kochetov & Richard Beare. 2020. An ultrasound and formant study of manner contrasts at four coronal places of articulation. *The Journal of the Acoustical Society of America* 148.5, 3195–3217. doi: 10.1121/10.0002486.

Turpin, Myfany, Katherin Demuth & April Ngampart Campbell. 2014. Phonological aspects of Arandic baby talk. In Rob Pensalfini, Diana Guillemin & Myfany Turpin (eds.), *Language description informed by theory*, 49–79. Amsterdam: John Benjamins.

Ultan, Russel. 1978. Size-sound symbolism. In Joseph Greenberg (ed.), *Universals of human language* II, 525–568. Stanford, CA: Stanford University Press.

Valdivia, Luis de. 1606. *Arte, y gramatica general de la lengua que corre en todo el Reyno de Chile, con un vocabulario y confessionario*. Seville: Thomás López de Haro.

Valdivia, Luis de. 1621. *Sermón en la lengua de Chile, de los misterios de nuestra fé catholica, para predicarla a los indios infieles del Reyno de Chile, dividido en nueve partes pequeñas de acuerdo a su capacidad.* Valladolid, Spain.

Vanhove, Martine & Mohamed-Tahir Hamid Ahmed. 2018. Diminutives and augmentatives in Beja (North-Cushitic). *Studies in Language* 42.1, 51–80.

Viegas Barros, Pedro. 1999. Aspectos fonéticos y fonológicos de la dialectología del mapudungun en la Argentina. In *Actas de las iii jornadas de etnolingüística*, 141–149. Rosario, Argentina: Universidad Nacional de Rosario, Facultad de Humanidades y Artes, Escuela de Antropología.

Villena, Belén. 2017. Fuentes para el estudio del mapudungún: Propuesta de periodización. *Lenguas y Literaturas Indoamericanas* 1.19, 141–167.

Villena, Belén, María Teresa Cabré & Sabela Fernández-Silva. 2019. Formación de nombres en mapudungún: Productividad, genuinidad y planificación. *Revista Signos* 52.100, 615–638.
Winter, Bodo, Grace Eunhae Oh, Iris Hübscher, Kaori Idemaru, Lucien Brown, Pilar Prieto & Sven Grawunder. 2021. Rethinking the frequency code: a meta-analytic review of the role of acoustic body size in communicative phenomena. *Philosophical Transactions of the Royal Society B* 376, 1–13.
Winter, Bodo & Marcus Perlman. 2021. Size sound symbolism in the English lexicon. *Glossa: A Journal of General Linguistics* 6.1, 1–13.
Winter, Bodo, Greg Woodin & Marcus Perlman. in press. Defining iconicity for the cognitive sciences. In Olga Fischer, Kimi Akita & Pamela Perniss (eds.), *The Oxford handbook of iconicity.* Oxford: Oxford University Press.
Yliniemi, Juha. 2021. Similarity of mirative and contrastive focus: three parameters for describing attention markers. *Linguistic Typology* 27.1, 77–111.
Zúñiga, Fernando. 2003. Some notes on the Mapudungun evidential. Ms., University of Leipzig.
Zúñiga, Fernando. 2006. *Mapudungun: El habla mapuche.* Santiago, Chile: Centro de Estudios Públicos.
Zúñiga, Fernando. 2017. Mapudungun. In Michael Fortescue, Marianne Mithun & Nicholas Evans (eds.), *The Oxford handbook of polysynthesis*, 696–712. Oxford: Oxford University Press.
Zúñiga, Fernando & Aldo Olate. 2017. El estado de la lengua mapuche, diez años después. In Isabel Aninat, Verónica Figueroa & Ricardo González (eds.), *El pueblo mapuche en el siglo XXI: propuestas para un nuevo entendimiento entre culturas en Chile*, 342–374. Santiago, Chile: Centro de Estudios Públicos.
Zúñiga, Fernando & Rafael Suter. 2007. Las palabras mapuches kuse y fücha, y el dào dé jīng. *Lingüística* 18, 99–129.

Cite this article: Molineaux, Benjamin. 2025. "Affective coronal alternations in Mapudungun: Sound symbolism, change, and morpho-phonological structure." *Journal of Linguistics*. doi:10.1017/S002222672500012X