

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

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 crosslinguistically common in implying small size, tenderness, closeness and politeness (e.g. [nazki] ‘cat’ → [ɲaʃki] ‘kitty’), however, the effects of dentalisation are more unexpected, implying distance, abruptness, sarcasm and rudeness (e.g. [nazki] ‘cat’ → [ɲaθki] ‘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 one based on floating diminutive and augmentative morphemes spreading the [DISTRIBUTED] and [ANTERIOR] feature nodes to the target coronal consonants, along with their language-specific pragmatics.

1 Introduction

Sound-symbolism refers to human speech which approximates the sounds associated to a particular real-world referents. As such, it encompasses a multiplicity of phenomena ranging from the paralinguistic and imitative to the pragmatic modulation of pre-existing phonological units. The degree of integration of these iconic elements of speech into the grammatical system varies widely. The nature of such interfaces is, furthermore, of some importance to linguistic theory, as it straddles the fundamental question of arbitrariness v. iconicity in linguistic forms. It is also an interesting question for historical (and evolutionary) linguists, as this cline suggest a diachronic pathway from purely indexical sounds into structured units integrated into grammatical systems.

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

¹“la expresión de valores de tipo afectivo, en mapudungun, se realiza mediante la fluctuación de sonidos, mien-

In Catrileo’s work (and elsewhere, see §2 and §3 below), we find that, where a coronal consonant shows an alternant which 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 crosslinguistically (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 §5, below). More typologically unexpected is the opposite trend, where Mapudungun coronal consonants may be dentalised, such that the dental alternant may have an augmentative-like meaning, which most often has a rude or pejorative connotation, as in (1c–d).²

- (1) a. [lamɲen] → [ʎamɲɛn]
 ‘sister’ ‘(lovely) little sister’
- b. [nazki] → [ɲafki]
 ‘cat’ ‘(lovely) kitty’
- c. [lamɲen] → [lamɲɛn̪]
 ‘sister’ ‘(horrible/damned) sister’
- d. [nazki] → [naθki]
 ‘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, taking a ‘shared reading’ approach. 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 affective morphemes 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, the endangered, heritage language of the Mapuche people, has a long descriptive tradition highlighting apparently ‘unconditioned’ phonological alternations. Indeed, a number

tras que en otras lenguas, como el español por ejemplo, se efectúan predominantemente con recursos morfosintácticos.” NB: throughout, translations from Spanish, French and Latin are my own.

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

of researchers (Key 1976, 1979, Key & Clairis 1976, Martinet 1983, Clairis 1991, Salas 1992) 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).³ 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 et al. 2006, Cañumil 2011), directly contradicting the idea that they are context-independent. In this section, we survey the system of coronal consonants in the language (§2.1), as well as the present-day patterns of dentalisation and palatalisation claimed to trigger Mapudungun speaker’s ‘affective’ readings of words and utterances (§2.2).

2.1 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.⁴

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

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

It is worth noting that the typologically uncommon dental-alveolar contrast of Mapudungun⁵ 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 2.⁶

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 Sadowsky et al. 2013). Among fricatives, however, there is some further asymmetry. This is mostly to do with the

³See Molineaux (in prep) for a more in-depth critique of the concept.

⁴*Contra* Sadowsky et al. (2013), here I have conflated postalveolar and palatal places of articulation. I also treat /ɥ/ as a glide rather than as the fricative /ɣ/, which it is often realised as.

⁵At 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.

⁶For fricatives, only near-minimal pairs may be found, since the alveolar sibilant (/s/) is mostly restricted to borrowings from Spanish and Quechuan.

Table 2: (Near-)minimal dental-alveolar pairs (from Painequeo et al. 2018 and Augusta 1916)

Stops	Nasals	Laterals	Fricatives
[t̪ən] ‘head louse’	[pu.ɲ] ‘night’	[ki.la] ‘bamboo’	[θa.kel] ‘pact/agreement’
[tən] ‘high sound’	[pu.n] ‘I arrived’	[ki.la] ‘three’	[sa.ku] ‘sack’ (<Spa.‘saco’)

fact that the phoneme /s/ is a fairly recent newcomer to the language, appearing mostly in borrowings from Spanish and Quechua (see Molineaux 2022 for an overview), often in alternation with /θ/, /z/, /tʃ/ or /ʃ/, as exemplified in (2).

- (2) a. /laθu/ < Sp. /laso/ ‘rope’
 b. /tʃumpiru/ < Sp. /sombbrero/ ‘hat’
 c. /izpada/ < 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 /z/, 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.⁷

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

Word	gloss	Etymon	gloss
wɛʃ-wɛʃ	‘crazy/naughty’	wɛz̪a	‘bad’
aɬuʃ	‘(nice and) warm’	aɬuθ	‘warm’
azɔʃ	‘rice’	aros	‘rice’ (Spanish)
ufiʃa	‘sheep’	oβɛʃa	‘sheep’ (Colonial Spanish)
miʃki	‘honey/sweet’	misk’i	‘honey/sweet’ (Southern Quechua)

2.2 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: 52). Key examples for her Central Mapudungun dialect are provided in Table 4, focusing on words with ‘neutral’ alveolar and retroflex consonants.⁸

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

⁸In the case of palatalised stops, Catrileo gives [t̪], a transcriptional equivalent of IPA [c], which is claimed to alternate with [t̪ʃ]. 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.

Table 4: Affective alternations in Catrileo 1986, 2010: Alveolars and retroflexes

Neutral	gloss	Affected	gloss
tunten	'how much?'	tʃuntʃeɲ tʃuntɛn	'how much, please?' 'how much, already!?'
fejti tati	'yes, that's it'	fejʃi tʃatʃi fejti tati	'please believe me, that's it' 'that's it, don't ask again!'
siʎo	'partridge'	ʃiʎo θiʎo	'little/lovely partridge' 'annoying partridge'
siʎɲaw	'wild radish'	ʃiʎɲaw θiʎɲaw	'yummy wild radish' 'yucky wild radish'
nɪlan	'I did not grab'	nɪlan nɪʎan	'please, believe me, I did not grab' 'I did not grab (how dare you suggest it)'
nɪʃzɐm	'conversation'	nɪʃzɐm nɪʃɐm	'a nice chat' 'to have words'
lifkɪlej	'it is clean'	ʎifkɪlej ʎifkɪleji	'it's really nice and clean' 'it's clean, for what it's worth'
ʃzɛwa	'dog'	ʃzɛwa tɛwa	'doggy' 'unpleasant dog'
ʃzɪpɐpe	'let them out!'	ʃʃɪpɐpe tɪpɐpe	'let the poor souls out' 'let them out, if you must'
zɐmtun	'question'	ʃɐmtun θɐmtun	'nice question' 'darned question'
miʃke	'toasted flour'	miʃke miθke	'yummy toasted flour' 'yucky toasted flour'

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. In the absence of an initial coronal, a later coronal in the root morpheme may undergo the affective process (see §6 below for details).

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

Negative	Neutral	Positive
t̪	t ʃʂ	ʃʃ
θ	s z	ʃ
n̪	n	ɲ
l̪	l	ʎ

Catrileo 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. The same pattern, however, does not hold for dentalisation, which does not index any age group. Of particu-

lar interest are more extreme forms of the palatalised fricative which result in the aproximant [j], a feature found predominantly in child or child-directed speech. Examples are [jamtun] for ‘wee/nice question’ or [mijke] 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 et al. 1994: 2 and §5 below). 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 (Sapir 1911, Silverstein 1994: 45-46, however see Ponsonnet 2018).

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.⁹

- (3) a. [nimin] ‘smell’ ~ [ɲimɲɲ] ‘aroma’ ~ [ɲimɲɲ] ‘stench’
 b. [inin] ‘keep water in one’s mouth’ ~ [ɲɲɲ] ‘delicious’ ~ [ɲɲɲ] ‘disgusting’
 c. [koʔzi] ‘salty/sour’ ~ [kotʃi] ‘sweet’
 d. [ʔzafoj] ‘break’ ~ [tʃafoj] ‘cough’
 e. [kuze] ‘wife’ ~ [kufe] ‘sweet old woman’ ~ [kuθe] ‘nasty old woman’
 f. [fita] ‘big/old/wise’ ~ [fiʔza] ‘big thing’ ~ [fiʔja] ‘big person’ ~ [fiʔta] ‘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, as evidenced from Table 6. There are, however, a substantial number of roots that have dentals or palatals without having any obvious affective connotations, as can be seen in Table 7.

Table 6: Non-alternating, affective items

	Negative connotation		Positive/small connotation
weθa	‘bad’	ʃetʃi	‘dwarf/gnome’
aʔa	‘bad/perverse’	pitʃi	‘small/wee’
kaʔku	‘wizard’	ʌufu	‘newborn’
ɲape	‘slow/lazy’	ɲapa	‘beloved friend/sister’

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.

⁹The case of [inin] and its alternants comes from Painequeo et al. (2018) and Augusta (1916); that of [fita] and its alternants is from Zúñiga 2006: 341, note xii and Zúñiga & Suter 2007.

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

Dental		Palatal	
θiŋu-	‘speak’	paʃiŋka	‘bronze’
ʦue	‘earth/ground’	kaʃu	‘grass’
paʃu	‘paternal aunt’	ʃaʃa	‘pot’
wiŋ	‘mouth’	iwɪŋ	‘grease/fat’

Table 8: Affective palatalisation of dentals and dentalisation of palatals in Catrileo 1986, 2010

Neutral	gloss	Affected	gloss
θewmalen (~sewmalen)	‘prepare this for me’	ʃewmalen	‘Please, prepare this for me’
θomo (~somo)	‘woman’	ʃomo	‘kind/lovely woman’
ʦiŋkilej	‘They are calm’	ʃiŋkilej	‘They are nice and calm’
ŋamunʦuj	‘they go on foot’	ŋamuntu	‘they go on foot, poor things’
ʃimiŋe	‘swallow!’	ʃimiŋe	‘swallow for me, please’
ʃalin	‘greeting’	ʦalin	‘unpleasant greeting’
ʃem	‘what thing’	ʦem	‘what unpleasant thing’
ʃe	‘person’	ʦe	‘unpleasant person’
ŋom	‘tame’	ŋom	‘unpleasantly tame’
aʃkituen	‘listen to me’	aʃkituen	‘for the last time, listen to me’

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 collaborator, Fresia Loncon Antileo was able to produce these, which, anecdotally, have a longer closure and greater apical protrusion (marked as ‘half long’ [ː] in Table 9). In the case of palatals, positive affect seems to also rely on a more emphatic form in the affricates. Here Catrileo (both 1986 and 2010) reports that the affricate becomes a full post-alveolar stop (IPA [ɟ], but [tː] 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 is provided, probably due to the rarity of this sound outside of the context of affective palatalisation. Again, our collaborator 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 is summarised in Table 10.

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,

Table 9: ‘Emphatic’ affect in dentals and palatals according to Catrileo 2010

Neutral	gloss	Affected	gloss
t̪iŋkilej	‘They are calm’	t̪̥iŋkilej	‘They are annoyingly calm’
ɲamuɲtuj	‘they go on foot’	ɲ̥amuɲ̥tuj	‘they go on foot, foolishly’
l̪imiŋe	‘swallow!’	l̪̥imiŋe	‘I command you to swallow’
t̪ʃalin	‘greeting’	çalin	‘pleasant greeting’
t̪ʃem	‘what thing’	çem	‘what little thing’
t̪ʃe	‘person’	çe	‘cherished person’
ɲom	‘tame’	ɲom	‘lovely and tame’
aɫkituen	‘listen to me’	alkituen	‘please listen to me’

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

Negative affect	Neutral affect	Positive affect
t̪̥ ?	t̪	t̪ʃ
?	θ	ʃ
ɲ̥ ?	ɲ	ɲ
l̪̥ ?	l̪	ɫ
t̪	t̪ʃ	ç ?
ɲ	ɲ	n ?
l̪	ɫ	l ?

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 (/t̪ʃ/ → /t̪/ and /z/ → /ð/). Interestingly, here the palatalisation process is claimed to have been expanded beyond coronals to labio-dental /f/, at least in one item ([kofke] ‘bread’ v. [kofʃke] ‘lovely/little bread’), and to velar /ŋ/ in another item ([fanteŋ(e)i] ‘it’s this size’ v. [fanteɲi] ‘it’s this wee size’). 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).¹⁰ 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 sections we examine the data for the Missionary and Ethnographic periods, since the Pre-Textual data is mostly onomastic and too sparse, and we have already examined much of what would fall under the Institutional Period. The data in what follows is gathered through searches both in the published, tagged version of the *Corpus of Historical Mapudungun* (CHM – Molineaux & Karaiskos 2021) and in the untagged texts available through its source page (Molineaux 2024, see also Molineaux 2023).

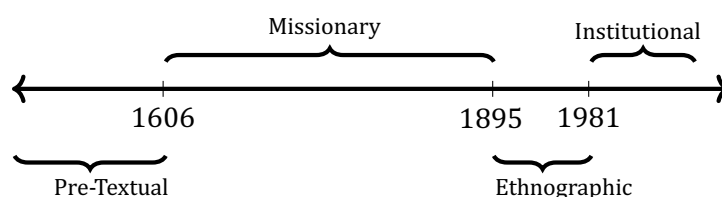


Figure 1: Mapudungun textual production periods according to Villena 2017

3.1 Coronal alternations in the Missionary Period

3.1.1 The turn of the 17th 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).

Table 11: Consonant inventory for late-16c Northern Mapudungun, based on Valdivia (1606)

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

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

¹⁰“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”.

(c) the lack of discernible contrast between dental and alveolar stops.¹¹ 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’)¹² or Spanish (e.g. *ispada* ‘sword’ *Dios* ‘God’) origin. As for /ʃ/, or its voiced counterpart, /z/, there is no straightforward spelling to represent it, based on 16c 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’.¹³ Interestingly, however, in items where we would expect affective palatalisation of /z/ 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 /kuze/ ‘wife’,¹⁴ probably representing the gliding form /j/.

As regards the stops (difference c), it is worth saying that a distinction between the Mapudungun alveolar and the dental was not observed until the late 19th 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 17th 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 speakers. I believe this scenario is far more likely than that of a later split between dentals and alveolars 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, tʃ, ʎ/) in words with inherently positive connotations or which show affective alternation today, and explicitly dental spellings (<d, n, ld/l’> for /ð, ɲ, ʎ/) for words with negative connotations or affective alternations today, as can be seen in Table 12.¹⁵ 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.¹⁶

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

¹¹I also take the retroflex stop to lack the affrication of contemporary dialects, as argued in Molineaux 2021: 33 fn.10 and 2022: 665.

¹²Another 17c 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*.

¹³Here, 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 (Halm 2020).

¹⁴At 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 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.

¹⁵According to Augusta’s dictionary, 1916 [weluθuamɪn] means ‘to be distracted, mindless, confused’.

¹⁶The only two items that are spelled often and consistently as dentals are the verbal stem [ʎa-] ‘die’ and the adverb [aʎi] ‘too much’, which argues for the salience of the dental in contexts of negative affect and augmentation.

Table 12: Sample items with dental and palatal consonants in Valdivia 1606, 1621

Dental			Palatal		
<code>	[koðe]	‘stupid’	<pchi>	[pʧi]	‘small’
<huedon>	[weðon]	‘wound the head’	<cachomin>	[katʃomin]	‘pacify’
<ùden>	[iðen]	‘despise’	<ñochi>	[ɲotʃi]	‘a bit’
<l’an>	[lan]	‘death’	<llallingechi>	[ʎaʎiŋetʃi]	‘that are skinny’
<huedùduam>	[weʎiðuam]	‘cruel’	<yall>	[jaʎ]	‘child/offspring’
<lduquin>	[lukin]	‘dirty’	<lladqmin>	[ʎadkmin]	‘pity someone’
<n’otumin>	[ɲotumin]	‘act stubbornly’	<ñomclen>	[ɲomklen]	‘quiet’
<n’oiġen>	[ɲoiŋen]	‘be pugnacious’	<ñomelen>	[ɲomelen]	‘be peaceful’

pattern, despite no explicit treatment in the text and variably transparent semantics.

Table 13: Sample items with dental and palatal variants in Valdivia 1606, 1621

Alternat A			Alternat B		
<pozko>	[pozko]	‘yeast’	<pudku>	[puðku]	‘yeast’
<lduquin>	[lukin]	‘dirty’	<lluquingetupe>	[ʎukiŋetupe]	‘they will be soiled’
<yullin>	[juʎin]? [ʒuʎin]?	‘bee’	<dullin>	[ðuʎin]	‘bee’
<ùlcha>	[iʎtʃa]	‘married woman’	<ùllcha>	[iʎtʃa]	‘maiden’
<vùta>	[viʎa]? [viʎa]?	‘big/old/husband’	<vùcha>	[viʎa]	‘big/old’
<cure>	[kuzɛ]	‘married woman’	<cude>	[kuðe]	‘old woman’
<huera>	[weʒa]	‘bad’	<huedalay>	[weðalay]	‘they are not bad’

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). Valdivia’s *Vocabulary* (appended to his grammar) lists the word as <huera>, and this is the form that shows up 69 times in the Sermons. The alternative, dental form <hueda-> shows up only in two negative forms in the same text (<huedalay> ‘they are not bad’ and <huedalayay> ‘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 /weʒa/, but /weθa/ (see Sadowsky et al. 2019), and even /weʃa/, 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 ultimately suggest the lexicalisation of the affect-marked items.¹⁷

¹⁷Also noteworthy is the change in the form for ‘wizard/witch’, which is likely to have changed its meaning in the context of Christianisation. Indeed, Valdivia explicitly rails against <pu calcu> ‘witches/wizards’ in his Sermons, calling them *deceivers* and *devil worshippers*.

Table 14: ‘Neutral’ consonants in Valdivia (1606, 1621) v. present-day ‘affected’ consonants

<wera>	‘bad’	>	[weθa] (never [weza])
<por>	‘dirty’	>	[poθ] (never [poz])
<coilla>	‘lie’	>	[koj̥a] ([koj̥a] as ‘affective’)
<calcu>	‘wizard/witch’	>	[ka]ku] (never [kalku])

3.1.2 The 18th century (Febrés 1765, Havestadt 1777)

Two grammars of Mapudungun, with a variety of accompanying texts, were published by Jesuit priests in the 18c. The first, penned by Andrés Febrés (1734–1790), a Catalan, is explicitly in its metalinguistic commentary on coronal alternations:

“the Indians [sic] tend to turn some letters into others... the *t* [t] and the *th* [t] into *ch* [t̪] 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* [r] 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).¹⁸

The second grammarian was Bernard Havestadt (1714–1781), a Westphalian, who produced his description of the language 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*, *call*; wool: *lamûen*, *llamûen*; sister: *Chili*, *Chilli*; Chile: *colù*, *collù*; bright red; *moGeli*, *moGelli*; if I live: *ruca*, *duca*, *suca*; house: *huera*, *hueda*, *huesa*; bad: *carù*, *cadù*, *casù*; green, raw : *anùn*, *añun*; I sit: *ùñm*, *ùñm*; bird” (1777: 8).¹⁹

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) as in <fochum> for <fotum> ‘sonny’; <quisulen> for <quidule> ‘I am alone’; <siu> for <riu> ‘goldfinch’,²⁰ very much implying a sound-symbolic association.

¹⁸“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.”

¹⁹“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 ravis; *moGeli*, *moGelli*; si vivam: *ruca*, *duca*, *suca*; domus: *huera*, *hueda*, *huesa*; malus, a, um: *carù*, *cadù*, *casù*; viridis, crudus: *anùn*, *añun*; sedeo : *ùñm*, *ùñm*; avis.”

²⁰We assume here that [s] most likely represents a more post-alveolar form.

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> [koj~~ʎ~~a] (4) instead of present-day [koj~~ʎ~~a], a politeness and mitigation strategy that our present-day consultant recognised as being very productive in her own speech.

(4) Palatalisation as mitigation in Febrés (1765)²¹

- a. *inche coy~~ll~~atupaquelayu*
 intʃe koj~~ʎ~~a-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).²² However, the affective undertones become clear in Havestadt’s word lists, where we are told ‘it displeases older women to be called *cude*’, while ‘it pleases them to be called *cuse*’ (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).²³

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 /p~~l~~i/ and /a~~l~~i/ in present dialects. We further find cases of apparent ‘deprecativ’ dentalisation using the <ld> digraphs in Febrés’ transcriptions. For instance, <pe~~ld~~e> appears alongside <pe~~l~~e> for ‘mud’ (today /pe~~l~~e/), and <ma~~ld~~ùtuuyimi> 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 §3.1.1).

In short, then, the missionary period²⁴ shows some evidence for the ‘stylistic’ alternations of the kind described for present day forms of the language, but the nature of the orthographic

²¹Glossing: TR: transitiviser; CIS: cislocative; HAB: habitual; NEG: negative; 1: first person; S: singular; A: agent; 2: second person; P: patient.

²²Note that we are told that <x> represent the sound of Portuguese, so most likely a post-alveolar [ʃ].

²³“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.”

²⁴Although 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, as spoken by the Mapuche of the pampas on the eastern side of the Andes (1879). In those materials we find instances of the key alternations: <fo~~t~~ùm> v. <fo~~ch~~um> ‘son’; <cha~~l~~e> v. <challe> ‘in-law’; <hue~~z~~a> v. <huera> ‘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 [ʎ], as in <a~~ld~~ù> ‘(too) much’ and <ma~~lz~~ùn> 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.

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 19th century onward, the documentation of Mapudungun took on a more academic approach (see Malvestitti 2012: 20–24 and 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 from an array of locations of the Chilean territories. Despite this, he only came to identify the full range of dentals after his main collaborator, 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* [fɛ̃nt̪ɛ], *mæt·e* [mæt̪ɛ], etc. in order to show me the tip of the tongue peaking between his teeth; he clearly distinguished by ear whether I repeated *n·[ɲ]* or *n[n]*, etc.’ (1897: 130).²⁵

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–weʒa]) ‘bad’ and <kure–kuye–kuzhe–kude> [kuʒɛ–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).²⁶

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 15 and 16.

²⁵Calvun, dócil como siempre, al fin levantó en cada *fen·t·e mæt·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.’

²⁶El 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 transcripción lo que en boca del indígena fue intencionalmente algo distinto.

Table 15: Sample items with dental consonants in Lenz 1897

Dental		
<ɫ·ayaimi>	[ɫajajmi]	'you will die'
<koŋkəl·>	[koŋkəl]	'growl'
<fütt·a>v.<fütta>	[fiɫ:a]v.[fiɫ:a]	'husband/big'
<mətt·e weda>v.<mətte>,<wera>	[məɫ:e weθa] [məɫ:e] [weɫa]	'very bad'
<n'ümən'nei> v. <nümün>	[n̥iməŋnej]v.[nimin]	'it stinks' 'smell'
<mett·e podnei>	[meɫ:e poðnei]	'it is very dirty'
<fent·epun·>v.<fent'epun>	[fentepun]v.[fentʒepun]	'(so) very much'
<kudü>v.<kurü>	[kuθi]v.[kuzi]	'black'

Table 16: Sample items with palatal consonants in Lenz 1897

Palatal		
<shiwén>	[ʃiwen]	'companion'
<üşketu pamən>	[iʃketupamən]	'come rest'
<fücha>	[fiɫʃa]	'big'
<ɲiʎaɲ>	[ɲiʎaɲ]	'in-law'
<maʎ>	[maʎ]	'tame'
<ñochi>	[ɲotʃi]	'softly/slowly'
<ʎamɲén>	[ʎamɲen]	'sister'
<ʎig>v.<lig>	[ʎiɥ]v.[liɥ]	'white'

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 trilogy of works on Mapudungun (1903, 1910, 1916). The main exception to this is the claim, in the second edition of this *Lecturas* (1934: 202) that the replacement of <r> with <d> ([z] with [θ]) in the evidential suffix [-zke] is a sign of anger, as in <wentrudkelle> 'it is indeed a man (regretably)' or <ɲekatudkellelai> 'it is not this again (regretably)'. An opposite, pleasurable connotation is said to be attached to <shomoshkelle> 'it is indeed a woman (fortunately)', where both the initial /θ/ and suffixal /z/ of /θomozkeʎe/ 'it is indeed a woman' are palatalised.²⁷

Also indebted to Lenz, was the first published ethnically Mapuche ethnographer, Manuel Manquilef (1911, 2014). While his work brings together extremely authentic materials, 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 his native competence and a standard language ideology modelled on Spanish. Hence we see that the word for 'bad' is always <weda> and not <wera>, as in earlier sources. We also see a clear division

²⁷ A possible case of pejorative [ɫ] 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 [tʃe] 'person'.

between <fücha> meaning ‘old’ and <füta> meaning ‘big’, possibly a partially lexicalised politeness 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 <zakiñ> [ʒakij] glossed as ‘love’ or ‘enjoyment’ for what is elsewhere [zakij] ‘thought’.

The most emblematic of the ethnographic texts is likely the autobiography of *Longko* (Chief *Paskual Koña* (late 1840s – 1927), transcribed by Wilhelm de Mösbach (1930), another Bavarian Franciscan. Although somewhat standardised in its spelling practices, we do see evidence for inherently affect-laden words having dental and palatal, such as <l·an> [lan] ‘death’, <mën·a> [mən̩a] ‘much’, <pod> [pɔð]; ‘dirty’, <ñañai> [ɲaɲaj] ‘female salutation’, <misha> [miʃa] ‘companion’, <chachai> [tʃatʃaj] ‘daddy’. Occasionally, there are transparent relations between the affective form and other forms as in the case of [zakij] ‘think, calculate’ and [ʒakij] ‘respect, think highly of’, as in (5), where we see palatalisation as a form of deference.

(5) Palatalisation as deference in Coña (1930: 14)²⁸

- a. *Mëtewe shakiñefui fillpëlle tēfachi mapu mew*
 mətewe ʒaki-ŋe-fu-j fiɫ-pəɫe təfatʃi mapu mew
 much think-PASS-BI-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 onomatopoeic item <ful·> ‘thump’ (6 a–b) as compared to the related verbal root <ful-> ‘dump’ (6 c). 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 suggests a divide in the sound inventory of the language, such that some segments are more prone to sound-symbolic associations (see also Antivero 2019). Indeed, in consultation with Fresia Loncon, this pattern seems to hold, where dental [ɫ] is more evocative of abruptness or coldness than [l], at least for some speakers of Mapudungun.

(6) Imitative and lexical forms in Coña (1930)²⁹

- a. «**ful·**» *pi ti karoti; naqi manshana püllü meu*
 fuɫ pi-i ti karoti nauɫ-i maɲʃana piɫi 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 naqn tēfachi manshana*
 nejku-fi fuɫfuɫ ij ɲi nauɫ-n təfatʃi maɲʃana
 loosen-3P.3A.ind thump-REDUP sound.3.IND POSS-3s down-NLZ these apple
 ‘he loosens them; ‘thum-thump’ sounds the fall of these apples’

²⁸Glossing: TR: transitiviser; CIS: cislocative; HAB: habitual; NEG: negative; 1: first person; s: singular; A: agent; 2: second person; P: patient.

²⁹Glossing: REDUP: reduplication; POSS: possessive; NLZ: nominalize; NEG: negative; 1: first person; s: singular; A: agent; 2: second person; P: patient.

c. <i>fulintëkuŋekei</i>	<i>kiñe epu külko fën manshana</i>
ful-in-təku-ŋe-ke-j	kiŋe epu kılko fın maŋana
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 (§3.1.2) in claiming that to create words analogue to Spanish ones with *-ito* (the diminutive) “they change a hard consonant into a soft one”(38), which he exemplifies with <fótəm> ‘son’ v. <fochəm> ‘sonny’; <domo> ‘woman’ v. <fomo> ‘little woman’ and <duam> ‘business’ v. <fuam> ‘favour’. More surprising, however is his suggestion of the suffix <-rke> as a means to create augmentatives like those with Spanish <-azo>. His examples are <trewa> ‘dog’ v. <trewarke> ‘big dog’ and <üñəm> ‘bird’ v. <üñəmərke> ‘big bird’.³⁰ The reasons for this are less clear, but may relate to the mirativity of the suffix as well as its frequent alternation with <-dke>. We will return to this question in §8, below.

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 20th century some clear data for alternations is 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 (1899–1926) and reflect a careful attempt at phonetic transcription which evidences substantial sub-phonemic alternations, including the kinds of affective phenomena we see to the west of the Andes, as seen in Table 17.

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, §2.2), we note that Lehmann-Nitsche’s data gives no suggestion of the process affecting labials, as in present-day Chubut. We turn to the implications of this in §6.3.

While the historical record shows affective alternations to be elusive for corpus analysis, 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. We have seen, however, that some forms appear to lexicalise the affective alternant (recall [[*ʃakɪŋ*]] ‘respect’ from

³⁰“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 sustantivo la partícula *rke* (ərke) v. gr.: *fótəm hijo*, *fochəm hijito*; *domo mujer*, *fomo mujercita*; *duam negocio*, *fuam favor*. *Trewa perro*, *trewarke perrazo*, *üñəm*, *üñəmərke pajarazo*, etc.”

Table 17: Sample alternating forms in Lehmann-Nietzsche’s texts Malvestitti 2012

Spelling	Sound	Elsewhere as	Gloss
<shayen>	/ʃajen/	/zajen/	‘flower’
<washkall>	/waʃkaʎ/	/waθa/+/kaʎ/	‘rattle (gourd+leather)’
<keshu>	[keʃu]	[kesu]	‘cheese’ <Spanish /keso/
<uäs’a, weda, weθa>	[weʃa, weða, weθa]	[weθa]	‘bad’
<t’okikelu>	[tʰokikelu]	[toki-ke-lu]	‘who is being a leader’
<met’e>	[meʧe]	[meʧe]	‘too much’
<kollü>	[koʎi]	[koli]	‘tan’ (here a variety of horse)
<pullku>	[puʎku]	[pulku]	‘alcoholic drink’
<üllcha, ülcha>	[iʎtʃa, iltʃa]	[iʎtʃa]	‘maiden, heavenly maiden’
<t’al’ka>	[tʰalʎa]	[tʃalka]	‘rifle’
<mochi>	[moʧʃi]	[moʧʃi]	‘(nice and) fat’
<lamñen>	[lamɲen]	[lamɲen]	‘sister’ (in a seductive song)
<lamn’en>	[lamɲen]	[lamɲen]	‘sister’ (disdainful greeting)

[zakin] ‘think’), while others seem to lose their more evocative or iconic forms as their meanings become more conventionalised ([fu] ‘thump’ v. [ful-] ‘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 resulting from the morphology in other languages. The most obvious comparison here is between diminutives and palatalisation, as already suggested starting from the 18th century. So we find [foʧʃim] (elsewhere [foʧim]) often glossing the Spanish *hij-ito* ‘child-DIM’. In most cases, however, a lexical item is also available, such as [pitʃi] ‘small’ in [pitʃi ʃsewa] ‘little dog’ glossing Spanish *perr-ito* ‘doggy’. Notably, the target word need not undergo the consonantal alternation (e.g. [tʃ] > [ʧ]).

Since size is the most concrete or explicit meaning of diminution, it is unsurprising such forms are easier to elicit and that the written record for Mapudungun reflects them either through lexical resources or palatalization. The more pragmatic dimensions of diminution, including politeness, epistemic uncertainty, affective proximity, sarcasm, etc., are far less likely to be conveyed by lexical resources. The pragmatic palatalisations, furthermore, may not make it in to 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 potential evidence for this being the case etymologically, in words referring to inherently large things or quantities, like [aʎi] ‘(too) much’, [miʧe] ‘much/many’ or [feʧe] ‘so much’, however the forms seem highly lexicalised. This lack of a more obviously transparent augmentative form means that the dentalisation processes are much more subtle overall, encapsulating more pragmatic functions associated to augmentation, such as defer-

ence, disapproval, abruptness, distance or disdain and hence being 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 one hundred 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 [-iʎ]

While not a productive suffix in present-day Mapudungun, word-final [-iʎ] — termed *appreciative diminutive* by Villena et al. (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 18, based on entries from Augusta’s dictionary *Augusta 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 coronal in *fodüll* ‘pit/stone’).³¹

Table 18: Words ending in <üll> ([-iʎ]) and possible base forms in *Augusta 1916*

Suffixed word	Gloss	Proposed base	Gloss
<changüll>	‘finger’	<chang>	‘leg, branch’
<añapüll>	‘shrunken/stumpy person, dwarf’	<añay>	‘friend’
<pangküll>	‘puma cub’	<pangi>	‘puma’
<fodüll>	‘(fruit) pit/stone’	<fodo/foro>	‘bone’
<kowüll>	‘watery fruit (zabala fruit)’	<ko>	‘water’
<kufüll>	‘shellfish’	<kuf>	‘bloated/empty’

4.2 The evidential [- (i)ʒke]/[- (i)θke]

Already in his 18th century grammar, Havestadt notes that the evidential suffix [-ʒke] alternates *ad libitum* (‘freely’) with [-ðke], [-ske] and [-ʒke] (1777: 103). Contemporary grammars and studies (Salas 1992, Zúñiga 2006, 2003, Hasler 2012, Hasler et al. 2020), referring to the retroflex form [- (i)ʒke], describe the morpheme as an evidential, with two main roles: reportative/inferential (REP) and perceptual/admirative (ADM), which I exemplify in (7).

- (7) a. *kiñe rupachi kiñe domo kalko-rke nie-rke-fu-y aľün püñeñ.*
 one occasion one woman witch-ADM have-REP-IR-IND.3 much child

‘One time, a woman who turned out to be a witch, it is said had many children.’

³¹A 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 [pitʃi] ‘small’. Another case might be the word for a ‘elbow’ [chunil], also in Valdivia (compare Augusta *chunui, chunuyküley, chunuykünuwün*. See also Pache 2014: 352 ff. regarding the origins of [- (i)ʎ].

(Salas 1992:269)

- b. *Tüfachi trewa-rke amta wangkü-wangkü-nge-y 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. *May, fey-ürke, iñche tayi pe-fi-ñ tüfachi trewa.*
yes, 3-ADM 1s a.while.ago ver-3.DIR-IND.1.S 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 referring to an interlocutor as something that has been reported to be of import. The further link to the augmentative interpretation that we saw was given by Moesbach (1962) is also unsurprising, as the most concrete interpretation of something worth of note or admiration is based on its size.

Interestingly, the earliest attestations of the suffix in Valdivia (1606, 1621) show exclusively <dq̄> ([-ðke]) spellings, while contemporary usage strongly favours <-rke> ([-z̄ke]). The early forms, exemplified in (8) appear to be of the admirative type, much as in (7b-c)

- (8) a. <quiñe-dq̄> one-ADM ‘each one’
b. <Christo-dq̄> Christ-ADM ‘Christ alone’
c. <eymi-dq̄> 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, which we have reviewed throughout. The apparent loss of this 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 3.2.1).

4.3 The ineffectual /-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). It also shows a range of forms, including [p̄iʒa] and [p̄iʃa] as evidenced in (9)

- (9) a. <kip**pü**daiafuimi> ‘You would have known anyways’ (Moesbach 1962: 103)
 b. <am**pü**dan> ‘I went there to no avail’ (Hernández et al. 2006: 127)
 c. <puwüluw**pü**daimi> ‘you defend yourself in vain’ (Coña 1930: 207)
 d. <illkut**pü**ran> ‘become angry with someone for no reason’ (Augusta 1916)

As with [-z̥ke], 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 is evidenced in the use of the dental fricative. Given the forms with [z̥], we may assume that the retroflex form is its neutral realisation, at least etymologically. As a verbal root, [p̥ɪz̥a] 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 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 §52*

Sound-symbolism is the general principle by which meaning can be more or less directly mapped on to phonic substance.³² 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). While languages and cultures vary in their reliance on sound-symbolism, it is generally agreed that it constitutes a fairly restricted domain within users’ linguistic repertoire (Ohala 1994: 325). Sound-symbolic behaviour, furthermore, is on a cline with fully conventionalised (read: arbitrary) spoken-language behaviour. Hence, on one pole are fully involuntary vocal expressions of a speaker’s internal state — Whitman’s actual ‘barbaric yawp’ — which Hinton et al. (1994: 2) refer to as ‘corporeal sound symbolism’. On the other side are items fully dissociated from their referent — words such as *roofs* or *accuses*. In between lie more clearly imitative, onomatopoeic elements — the word *yawp* — and conventionalised,

³²In 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).

ideophonic sound-symbolic sequences — as the /sw/ cluster in *swoop*, to convey swift movement (compare *swing*, *swish*, *swat*, etc. — see Oswald 1994).

Key to our later discussion is the category of ‘synaesthetic’ sound-symbolic elements, which Hinton et al. (1994: 4) consider to be the “acoustic symbolization of non-acoustic phenomena”. An example of this might be indexing 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 indexicality is fairly transparent and perhaps universal, as are the use of high pitch for small things and low pitch for large ones (cf. Ohala 1994). However, this is an area within sound-symbolic phenomena that is particularly prone to become conventional (Hinton et al. 1994: 4), and 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’ vocabulary we might find the use of clicks in non-click languages to denote exasperation or disapproval, 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 *tut-tut* [t^hʌt[?] t^hʌt[?]] or *oink* [õĩŋk] 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. A case in point is Silverman’s (1994) description of Waco-Wishan, a Chinook language which has a series of consonantal and vocalic elements used exclusively in (hyper)diminutives and (super)augmentatives (see also Sapir 1911).

5.1 Size symbolism and the ‘Frequency Code’

Although it shows different degrees of conventionality, a crosslinguistically 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).³³ 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 will see, however, the mirror image of diminutives — augmentatives — seem to have a less regular segmental correspondences.

A systematisation 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 consonants) as summarised in Table 5.1. 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

³³Although see Diffloth (1994) for a reversal of this pattern in the Mon-Khmer language Bahnar.

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, something that had been experimentally tested already by Sapir (1929) nearly a hundred years ago, at least for vocalic elements ([a] v. [i]).

Table 19: 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*

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 indexical 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 range 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 often found in non-alternating words with the meaning ‘much’ or ‘big’. 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 type, these may be very culturally specific and unpredictable (Ponsonnet 2018). This is particularly the case with the augmentatives of Mapudungun, which appear to acquire specific meanings leading to lexicalisation and morphologisation. As a result, the direct symbolic links to size are not particularly transparent, weakening the explanatory power of sound symbolism, at least for the synchronic grammar of Mapudungun and particularly for dentalisation therein.

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. Tabain et al. 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 indexation of augmentatives, rather than dentals. Indeed, as Ohala himself claims, the biggest consonantal place opposition we might expect as regards the frequency code would be between coronals and non-coronals (1994: 335).³⁴

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) show the main parameter distinguishing them is F2 at the onset of adjacent vowels, where dentals cause a greater depression than alveolars.³⁵ In other words, if the frequency code does have any relevance to the 'large' end of size symbolism, this is not fully phonetically transparent, but is quite deeply embedded in the phonological system, such that the more transparent, no-coronal, low frequency forms are set aside in favour of coronal-internal alternations.

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. The diachronic data actually help here: particularly the dentalised forms are quick to either be lexicalised or morphologised, showing that the indexical relationships are non-transparent and difficult to retrieve as an active process.

6 Formalisation

Seeing as how we have shown that the coronal alternations of Mapudungun cannot be simply characterised as indexical, 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 that they are 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 phonemes into natural classes. We therefore need to postulate a plausible set of features for the coronal consonants of Mapudungun and the geometry that supports it.

Excluding the easternmost (Argentinian) varieties, all the relevant expressive processes are restricted to coronal place. As a result, it seems uncontroversial to posit that the coronal do-

³⁴Interestingly, 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 strongly correlated with 'largeness' and 'distance' connotations as palatals are to the opposite traits.

³⁵These two studies focus only on non-fricatives. 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.

main 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 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 20.

Table 20: Contrast matrix for Mapudungun coronals

Coronal			
laminal		apical	
anterior	posterior	anterior	posterior
t̪	t̪ʰ	t	t̪ʰ
θ	ʃ	(s)	ʒ
n̪	ɲ	n	
l̪	ʎ	l	

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 ([θ] v. [ʒ]) display a different pattern. Here, /s/ is a recent borrowing and patterns with the apico-alveolars while not being apical itself (Sadovsky 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).³⁶

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

³⁶Contra 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/.

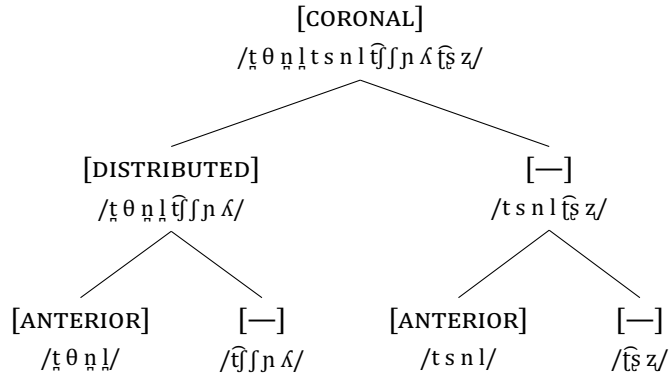


Figure 2: Proposed feature tree for Mapudungun coronal consonants

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 §6.2, below). 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).

6.2 Representation: affective alternations as derivational morphology

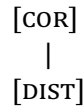
In our review of the Mapudungun materials, we noted that while amenable to a sound symbolic interpretation at a certain level of analysis, the affective alternations we have described often become lexicalised or morphologised, and hence fail to alternate with the same contextual freedom. Here, I take 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 derivational, which have the range of semantic and pragmatic meanings described by Catrileo (1986, 2010). Interestingly, however, the phonological makeup of the key morphemes must be sub-phonemic, consisting simply of the features necessary to convey the relevant affective alternation.

These *floating features* behave much in the same way as tone-only morphology does (cf. Clements & Ford 1979, Hyman 2011), in that they are autosegmental in nature, without a pre-ordained segmental slot. As such they are computed at the same stage in the speech planning as other morphological processes and interface with phonology in a similar manner to fully segmental morphemes. In this case, their presence is only perceptible by their effect on segmental material.

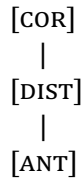
Provided with this architecture and the feature geometry proposed in the previous section, the affective alternations are surprisingly simple in their representation. Positive affect is characterised by the presence of a diminutive floating morpheme with the feature [DISTRIBUTED], while negative affect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

(10) Floating morphemes

a. *Diminutive (DIM)*

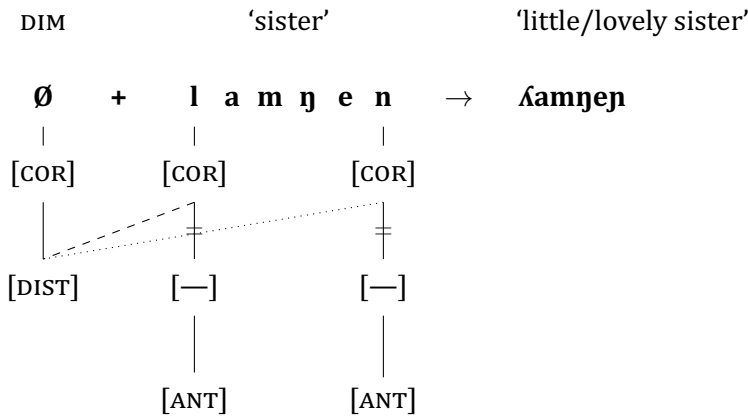


b. *Augmentative (AUG)*

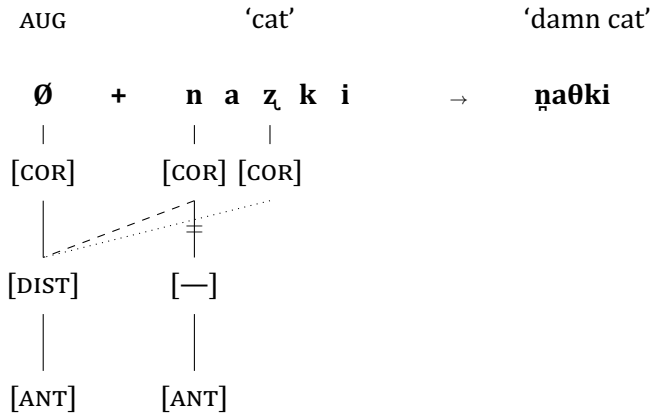


Note that the featural tier below [DISTRIBUTED] is only specified for the augmentative. Indeed, in this system we assume that spreading of a feature entails spreading of any or no dependent features. Furthermore, given that the overall pattern we observed in §2.2 seems to affect coronals from left to right, 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 appears to present some speaker variation, hence the dotted lines in the figures, representing weaker links.

(11) Diminutive (DIM) feature spreading

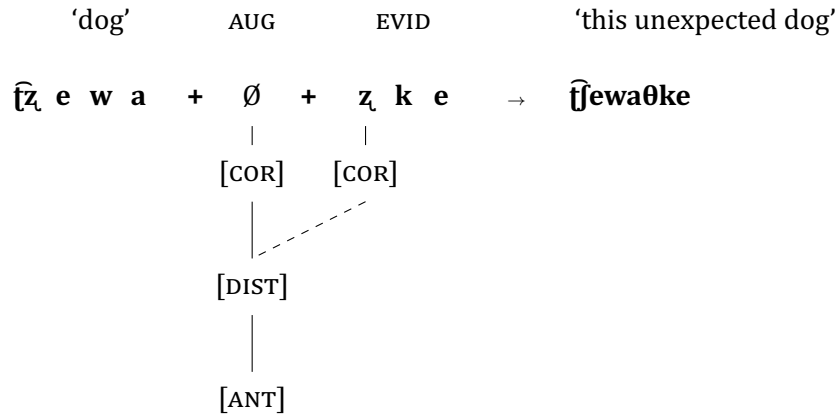


(12) Augmentative (AUG) feature spreading



While the process we suggest here predominantly affects lexical roots, some of the alternations we find in affectively laden suffixes (particularly [-z̥ke] and [-piθa]), it is not inconceivable that the floating morphemes can also attach to a subset of these suffixes, as exemplified in (13).

(13) Feature spreading to suffixes



An interesting potential corollary of this 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 the same position of the active articulator within a lexical root, leading to the assumption of a harmony process that spreads dental articulations to alveolars or vice-versa (no attempts at formalisation exist, to my knowledge). This leads to dental-only roots: [t̪o] ‘forehead’, [n̪ewen̪] ‘strength’, [l̪afken̪] ‘sea’, and alveolar-only ones: [piltan-] ‘tear apart’, [liu̪en̪] ‘silver’ and [son̪i] ‘wrinkle’. While exceptions do exist — cf. [n̪el-] ‘let loose’ and [l̪uan̪] ‘guanaco’, in Augusta (1916) — the generalisation seems to hold, and may indeed stretched further to include all features below the coronal tier, such that, within a root morpheme, coronals will always have the same specifications: cf. [t̪jamaɳ] ‘shawl’, [l̪awfep̪] ‘shade’, [ko[ʃ̪uz̪] ‘toasted’.³⁷ 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.

6.3 Affective alternations and language change

One of the more 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, §2.2 above) and from other historical Argentinian varieties registered by

³⁷There 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. [z̪ali] ‘dish’, [naʃ̪iŋ] ‘Solanum Gayanum (plant)’. More unexpectedly, the dental fricative seems not to have the same restrictions, particularly co-occurring with palatals: [θuɳi-] ‘chose’ [t̪oθ] ‘yellow’. This further suggests the more fundamental link between segments sharing a [DISTRIBUTED] feature than an [ANTERIOR] one, as implied in our geometry.

Lehmann-Nitsche (Malvestitti 2012, Table 17) the processes is not restricted to coronals, but may affect velars and even labials. The examples in the early 20th century data seem to affect velars both in terms of affective/diminutive palatalisation and pejorative 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 affect all consonantal place features. 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 17 palatalisation/dentalisation affects only one of the consonants in [lamŋen]→[lamɲen]~[lamɲen]), it may more broadly be classed as an analogical process, perhaps related to general language attrition and poor transmission of *Puelmapu* varieties.

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 which we have seen change their affective value, 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 21.³⁸

Table 21: Lexicalisation of affective alternants

Category	Dental	Palatal
Productive alternation	ʃ̥sewa~ʃ̥tewa ‘dog~damn dog’	ʃ̥sewa~ʃ̥tjewa ‘dog~doggy’
Long-term lexicalisation	aɭi ‘much’ ɲaj ‘woe’ moɭ- ‘be wrong’	pɪtʃi ‘small’ aɭa ‘pretty’ ɲom- ‘be calm’
Recent lexicalisation	kaɭku<kalku ‘wizard’ poθ<poz ‘dirty’	fɪjku<Sp.fresco ‘fresh/cool’ manʃun ‘ox’ <Sp.manso ‘tame’
Semantic split	ɪɲuɲ ‘foul-tasting’~ ɪnun ‘hold water in the mouth’ kuθe ‘nasty old woman’~kuze ‘wife’	faki- ‘respect’~zaki-‘think’ weɲi ‘boy/child’~weɲuj ‘friend/trainee’ kuje ‘lovely old woman’~kuze ‘wife’

A particularly interesting domain for the early lexicalisation category are kinship terms as well as terms of respect/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 22 (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.

³⁸Another interesting lexicalisation is the adverbial [miʃaj] ‘soon’, which comes fairly transparently from [miʃte] ‘more’, in a future [-a], third person form [-i], with a diminutive, politeness palatalisation: [miʃte]>[miʃte]+[a]+[i] ‘it will be a bit more’ > [miʃaj] ‘soon’.

Table 22: A representative sample of kinship terms and terms of endearment/respect

Term	Relation
laku	Paternal grandfather/grandchild (Namesake)
fiṭa	Husband
foṭim~foṭṭim	Son (of a man)
paḷu	Paternal aunt
miṇa	Cousin
ṇaṇiṇ	Mother/daughter in law
ṭjaw	Father
ṇuke	Mother
peṇi	Brother (of a man)
ṭeja	Sister (of a man)
lamṇen~lamṇeṇ	Sister of a man or sibling of a woman
ḷaḷa	mother/son in law
ṭjeṭki~ṭjeṭṭe	Maternal grandfather/grandchild
ṭjuṭju	Maternal grandmother/grandchild
ṇawe	daughter (of a man)
jaḷ	offspring (of a man)
piṇeṇ	offspring (of a woman)
koṇi	son (of a woman)
ṇeṇ	Owner/master
koṇa	Assistant
weṇuj~weṇi	Trainee/boy/friend
ṇaṇa	Close female friend (of a woman)
kaṭṭi	Partner/friend
miṭa	Friends who share a meal
kompaṇ	Travel companions <Sp: 'compañero'

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 collaborator.

Despite the elusive nature of the alternations, our survey found a consistent thread of meta-linguistic 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, being somewhat more loosely 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, and 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 (cf. 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 effected by rightward spreading of sub-phonemic ‘floating’ morphemes. 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 such that it can participate in the processes. The result of this is the higher ranking of [DISTRIBUTED] over [ANTERIOR] in our proposed feature hierarchy.

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) v. laminal (dental and palatal) v. 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 et al. 2014), very much as in the affective forms of Mapudungun.³⁹ 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.

While the intricacies of the Mapudungun system of affective alternations is 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 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 condi-

³⁹A similar pattern is documented for Walpiri, a related language, where baby talk collapses coronal consonants into the lamino-palatal series (Laughren 1984).

tioning morpheme is lost. Be this as it may, the Mapudungun data does 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. Although parallels with Quechuan affective palatalisation is intriguing (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.

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 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 consonants and affect. 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 ideophonic behaviour (recall /sw/-initial words in English).

Despite certain tendencies to exoticise or even fetishise indigenous cultures, the affective forms we find in the Mapudungun coronal system are in no straightforward way 'simpler' or more deeply connected to their referents than affective forms in other languages (cf. English 'wee X' or 'big old X'). The sound symbolic nature of the key processes is patently 'tame' in the sense of Rhodes (1994), demonstrating a high degree of cultural and structural embeddedness. They display abstract patterns at all levels of linguistic structure, from the non-concrete meaning of augmentation, to the [DISTRIBUTED] behaviour of apical /s̺/, to the conspicuous absence of dorsals and labials in the size-based consonantal alternations.

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 [pit̪i] 'small', [aḷi] 'much') and affect-prone domains (e.g. inherently good/bad, kinship and endearment terms, etc.). In the synchronic grammar, it is clear that the alternations rely on some degree of cognitive association between laminals and affective involvement, which can be characterised as broadly sound symbolic. However, given the semantic and morpho-phonological specificity of the patterns, it is hard to align these with more domain-general cross-linguistic tendencies. Indeed, it is our claim that the series of behaviours encompassed by affective coronal alternations can more parsimoniously be 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.

References

- 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. Bahía Blanca: Editorial de la Universidad Nacional del Sur.
- Augusta, Félix José. 1903. *Gramática araucana*. Valdivia: Imprenta Central J. Lampert.
- Augusta, Félix José. 1910. *Lecturas araucanas*. Padre Las Casas: Editorial San Francisco.
- Augusta, Félix José. 1916. *Diccionario araucano-español y español-araucano*. Santiago: Imprenta Universitaria.
- Augusta, Félix José. 1934. *Lecturas araucanas*. Segunda. Padre Las Casas: Editorial San Francisco.
- Barbará, Federico. 1879. *Manual ó vocabulario de la lengua pampa*. Buenos Aires: Imprenta C. Casavalle.
- 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.
- 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: 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: Facultad de Filosofía y Humanidades, Universidad Austral de Chile.
- Catrileo, María. 2022. La importancia de los enunciados simbólicos en la mantención del mapundungn 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, NY: Harper & Row.
- Clairis, Christos. 1991. Identification et typologie des fluctuations. *Bulletin de la Société de Linguistique de Paris* 86(1). 19–35.
- Clements, George Nicholas. 2003. Feature economy in sound systems. *Phonology* 20(3). 441–65.
- 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*. Ernesto Wilhelm de Moesbach & Rodolfo Lenz (eds.). Santiago: Imprenta Universitaria.
- Croese, Robert. 1980. Estudio dialectológico del mapuche. *Estudios Filológicos* 15. 7–38.
- de Saussure, Ferdinand. 1916. *Cours de linguistique générale*. C. Bally, A. Sechehaye & Albert Reidlinger (eds.). Translation: Wade Baskin (1957) as *Course in General Linguistics*, Glasgow: William Collins and Sons Ltd. Paris: Payot.
- Diffloth, Gérard. 1994. i: big, a: small. In Leanne Hinton, Johanna Nichols & John Ohala (eds.), *Sound symbolism*, 107–114. Cambridge University Press.
- 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: Universidad Nacional de La Pampa.
- Dresher, B. Elan. 2009. *The contrastive hierarchy in phonology*. Cambridge: Cambridge University Press.
- 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 Science*, 1–5. Glasgow: The 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>.
- 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. eng. In Harold Koch & Rachel Nordlinger (eds.), *The languages and linguistics of Australia: a comprehensive guide*, chap. 3, 91–138. Berlin/Boston: De Gruyter, Inc.
- 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.
- Hasler, Felipe. 2012. *El sistema de evidencialidad en mapudungun y sus transferencias al español mapuchizado*. Santiago: Universidad de Chile MA thesis.
- Hasler, Felipe, Aldo Olate & Guillermo Soto. 2020. Origen y desarrollo del sistema evidencial del mapudungun. In Aldo Olate (ed.), *Tame, gramaticalización e interfaz sintaxis-pragmática del español y el mapudungún*, vol. 81, 9–26. Círculo de Lingüística Aplicada a la Comunicación.
- Havestadt, Bernhard. 1777. *Chilidúgu: sieve tractatus linguæ chilensis*. Leipzig: Teubner.
- Haynie, Hannah, Claire Bower & 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: Imprenta Cervantes.
- Hernández, Arturo, Nelly Ramos & Rosa Huenchulaf. 2006. *Gramática básica de la lengua mapuche*. Vol. 1. Temuco: Universidad Católica de Temuco.
- Hinton, Leanne, Johanna Nichols & John Ohala. 1994. Introduction. In *Sound symbolism*, chap. 1, 1–14. Cambridge: Cambridge University Press.
- Hyman, Larry. 2011. Tone: is it different? In John Goldsmith, Jason Riggle & Alan C. L. Yu (eds.), *The handbook of phonological theory*, 2nd edn., chap. 7, 197–239. Oxford: Blackwell.
- Iosad, Pavel. 2017. *A substance-free framework for phonology: an analysis of the Breton dialect of Bothoa*. Edinburgh: Edinburgh University Press.
- Key, Mary Ritchie. 1976. La fluctuación de fonemas en la teoría 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: P.U.F.
- Key, Mary Ritchie & Christos Clairis. 1976. Fuegian and Central South American Language relationships. *Actes du 42ème Congrès International des Américanistes, Paris IV*. 635–645.
- King, Robert D. 1969. *Historical linguistics and generative grammar*. Englewood Cliffs: Prentice-Hall.
- Kiparsky, Paul. 1988. Phonological change. In Frederick J. Newmeyer (ed.), *Linguistics in the cambridge survey*, vol. 1, 363–415. Cambridge: Cambridge University Press.
- Laughren, Mary. 1984. Walpiri baby talk. *Australian Journal of Linguistics* 4. 73–88.
- Lenz, Rodolfo. 1897. *Estudios araucanos*. Santiago: Anales de la Universidad de Chile.
- Malvestitti, Marisa. 2012. *Mongeleluchi zungu: los textos araucanos documentados por Roberto Lehmann-Nitsche* (Estudios Indiana). Gebr. Mann Verlag.
- Manquilef, Manuel. 1911. *Comentarios del pueblo araucano i (la faz social)*. Rodolfo Lenz (ed.). Vol. II (Revista de Folklore Chileno). Santiago: Imprenta Cervantes.
- Manquilef, Manuel. 2014. *Manuel manquilef: comentarios del pueblo araucano ii (j gimnasia nacional – juegos, ejercicios y bailes)*. Rodolfo Lenz (ed.) (Anales e la Universidad CXXXIV). Santiago: Imprenta, Litografía y Encuadernación «Barcelona».
- Martinet, André. 1983. Ce que n'est pas la phonologie. *Langue française* 60. 6–13.
- Moesbach, Ernesto Wilhelm de. 1962. *Idioma mapuche*. Padre Las Casas: 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/>.
- Molineaux, Benjamin. in prep. 'Phoneme fluctuation' and language change.

- 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/>.
- Moran, Steven & Daniel McCloy. 2019. *PHOIBLE 2.0*. Jena: Max Planck Institute for the Science of Human History. <http://phoible.org>.
- Nichols, Johanna. 1971. Diminutive consonant symbolism in Western North America. *Language* 47(4). 826–848.
- Odden, David. 2006. Phonology ex nihilo. Talk.
- 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.
- Oswalt, Robert. 1994. Inanimate imitatives in english. In Leanne Hinton, Johanna Nichols & John Ohala (eds.), *Sound symbolism*, 293–306. 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 interdentes [ɲ], [ʎ] y [ʧ] 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*. Second Edition. Cambridge: Cambridge University Press.
- Ponsonnet, Maïa. 2018. A preliminary typology of emotional connotations in morphological diminutives and augmentatives. *Studies in Language* 42(1). 17–50.
- 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: OchoLibros.
- 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 & Karen Rice (eds.), *Blackwell companion to phonology*, chap. 22, 1–31. Wiley-Blackwell.
- Sadowsky, Scott, María José Aninao & Paul Heggarty. 2019. *Sound Comparisons: Mapudungun*. <https://soundcomparisons.com/Mapudungun>.
- Sadowsky, Scott, Héctor Painequeo, Gastón Salamanca & Heriberto Avelino. 2013. Mapudungun. *Journal of the International Phonetic Association: Illustration of the IPA* 43(1). 87–96.
- Salas, Adalberto. 1992. *El mapuche o araucano*. Madrid: MAPFRE.
- Sapir, Edward. 1911. Diminutive and Augmentative Consonantism in Wishram. In Philip Sapir & Victor Golla (eds.), *Volume VI: American Indian Languages 2*, 2010 re-edition, 243–262. Berlin, New York: De Gruyter Mouton. <https://doi.org/10.1515/9783110851090.243>.
- Sapir, Edward. 1915. Abnormal types of speech in Nootka. *Canada Geological Survey, memoir 62, anthropological series*, 5.
- Sapir, Edward. 1929. A study in phonetic symbolism. *Journal of experimental psychology* 12. 225–239.

- 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. <https://doi.org/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.
- Aspectos fonéticos y fonológicos de la dialectología del mapudungun en la Argentina*. 1999. Universidad Nacional de Rosario, Facultad de Humanidades y Artes, Escuela de Antropología. Rosario: Actas de las III Jornadas de Etnolingüística. 141–149.
- 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.
- 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. Unpublished Ms., University of Leipzig.
- Zúñiga, Fernando. 2006. *Mapudungun: El habla mapuche*. Santiago: 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 & Rafael Suter. 2007. Las palabras mapuches kuse y fúcha, y el dào dé jing. *Lingüística* 18. 99–129.