A grammar of A'ingae

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3. Phonology[1]

3.1. Introduction

This chapter outlines the phonology of A'ingae. It draws on earlier work by Borman (1962), Tobar Gutiérrez (1995), Repetti-Ludlow et al. (2019), Dąbkowski (2021, forthc.a), and Fischer & Hengeveld (forthc.). After presenting the phoneme inventory of A'ingae in Section 3.2, we describe phonological processes in Section 3.3, phonotactics in Section 3.4, orthography in Section 3.5, and prosody in Section 3.6. We round off the chapter by discussing morphophonological processes in Section 3.7.

3.2. Phoneme inventory

3.2.1. Consonants

3.2.1.1. Introduction

A'ingae has a moderately large consonant inventory consisting of 24 consonants, which are shown in Table 3.1. A characteristic feature of A'ingae is the three-way distinction within the classes of plosives and affricates, where voiceless, aspirated and prenasalized (and therefore voiced) phonemes are found.

Table 3.1. Consonants

	labial	alveolar	post-alveolar	velar	glottal
voiceless plosive	/p/	/t/		/k/	/ʔ/
aspirated plosive	/pʰ/	/tʰ/		/kʰ/	
prenasalized plosive	/ᵐb/	/ⁿd/		/ᵑg/	
voiceless affricate		/ʦ/	/ʧ/		
aspirated affricate		/ʦʰ/	/ʧʰ/		
prenasalized affricate		/ⁿʣ/	/ⁿʤ/		
fricative	/f/	/s/	/ʃ/		/h/
nasal	/m/	/n/			
flap		/ɾ/			
approximant				/ɯ̯/	

3.2.1.2. Plosives

There are 10 phonemic plosives in Cofán, articulated at four different places: the labials /p/, /pʰ/ and /ᵐb/, the alveolars /t/, /tʰ/ and /ⁿd/, the velars /k/, /kʰ/ and /ᵑg/ and a glottal stop /ʔ/.

The phonemic contrast between the labial plosives is shown in (1)-(4). The voiceless

[1] We are greatly indebted to Scott Anderbois, Maksymilian Dąbkowski, and Silke Hamann for their insightful comments on earlier versions of this chapter.

/p/ is in opposition with the aspirated /pʰ/ in (1); the voiceless /p/ with the prenazalized /ᵐb/ in (2); and the prenasalized /ᵐb/ with the aspirated /pʰ/ in (3). All three consonants are in near opposition in (4).

(1)	a.	/mã.**p**i/	[mã.pi]	where
	b.	/mã.**pʰ**i/	[mã.pʰi]	punish
(2)	a.	/ʦã.**p**i=ta/	[ʦã.pi.ta]	forest=NEW
	b.	/ʦã.**ᵐb**i.ta/	[ʦã.ᵐbi.ta]	otherwise
(3)	a.	/ka.**ᵐb**ĩã/	[ka.ᵐb̰ĩã]	change
	b.	/ka.**pʰ**ĩ-ã/	[ka.pʱ̰ĩã]	have.dirt.in.eye-CAUS
(4)	a.	/a.**p**i/	[a.pi]	mud
	b.	/ã.**pʰ**i/	[ã.pʰi]	fall
	c.	/ã=**ᵐb**i/	/ã.ᵐbi/	eat=NEG

The three alveolar plosives are shown in opposition in (5)-(6). The voiceless /t/ is in phonemic contrast with its aspirated counterpart /tʰ/ in (5), and both are contrasted with their prenasalized counterpart /ⁿd/ in (6).

(5)	a.	/o.**t**ãẽ/	[o.tã̰ḭ̃]	cook
	b.	/o.**tʰ**ãẽ/	[o.tʰã̰ḭ̃]	put something in its place
(6)	a.	/ã.**t**e/	[ã.te]	remain
	b.	/ã.**tʰ**ɛ/	[ã.tʰɛ]	stop
	c.	/ã.**ⁿd**e/	[ã.ⁿde]	land

Turning now to the velar plosives, the voiceless /k/ is in phonemic contrast with its aspirated and prenasalized counterparts /kʰ/ and /ᵑg/. This can be observed in examples (7) and (8) respectively. The aspirated and prenasalized velar plosives are also in phonemic opposition, as shown in (9).

(7)	a.	/**k**a.nĩ/	[ka.nĩ]	yesterday
	b.	/**kʰ**a=nĩ/	[kʰa.nĩ]	other=LOC
(8)	a.	/ã=**k**i/	[ã.ki]	eat=2
	b.	/ã=**ᵑg**i/	[ã.ᵑgi]	eat=1
(9)	a.	/ĩ.hã=**ᵑg**a/	[ĩ.hã.ᵑga]	want=DAT
	b.	/ĩ.hã.**kʰ**a/	[ĩ.hã.kʰa]	be careful

Tobar Gutiérrez (1995) does not include the glottal stop /ʔ/ in her consonant inventory. In our data, however, we find minimal pairs like (10)-(12), in which it is in phonemic opposition with the other voiceless plosives /p/, /t/ and /k/.

(10)	a.	/a.**ʔ**i/	[a.ʔi]	person
	b.	/a.**p**i/	[a.pi]	pan
(11)	a.	/ke.**ʔ**i/	[ke.ʔi]	2.PL
	b.	/ke=**t**i/	[ke.ti]	2.SG=INT
(12)	a.	/ʦe.**ʔ**i/	[ʦe.ʔi]	then
	b.	/ʦe=**k**i/	[ʦe.ki]	ANA=CLF:drn

The glottal stop is also in phonemic opposition with the glottal fricative /h/:

(13)	a.	/nã.**ʔ**ẽ/	[nã.ʔẽ]	river
	b.	/nã.**h**ẽ/	[nã.hẽ]	leaf

Note also the opposition created by the absence versus presence of the glottal stop, as in (14), taken from Repetti-Ludlow et al. (2019), and (15), from Dąbkowski (forthc.a):

(14)	a.	/ʧãʔ.ⁿdi/	[ʧãʔ.ⁿdi]	cold
	b.	/ʧã.ⁿdi/	[ʧãⁿdi]	clear
(15)	a.	/ʦa=ma/	[ʦa.ma]	ANA=ACC.REAL
	b.	/ʦa=ʔma/	[ʦaʔ.ma]	ANA=FRT

Repetti-Ludlow et al. (2019) note that the glottal stop has a limited distribution, and that it can be realized as creakiness or even be absent in rapid speech. It furthermore interacts with stress and stress deletion, as shown in Dąbkowski (forthc.a) and in Sections 3.6.2.3 and 3.7.5. This makes the glottal stop a rather special phoneme in the A'ingae consonant inventory.

3.2.1.3. Affricates

As with stops, there is a three-way manner opposition in the set of affricates between voiceless unaspirated, voiceless aspirated and prenasalized voiced affricates. As to place, alveolar and post-alveolar affricates are found.

The alveolar affricates /ʦ/, /ʦʰ/ and /ⁿʣ/ are shown in opposition in (16) and (17): voiceless unaspirated /ʦ/ is contrasted with voiceless aspirated /ʦʰ/ in (16) and with the latter and prenasalized /ⁿʣ/ in (17).

(16)	a.	/**ʦ**eʔ.**ʦ**e/	[ʦeʔ.ʦe]	chew
	b.	/**ʦʰ**eʔ.**ʦʰ**e/	[ʦʰeʔ.ʦʰe]	hit
(17)	a.	/**ʦ**ai-ɲã/	[ʦai-ɲã]	bite-CAUS
	b.	/**ⁿʣ**ai.ɲã/	[ⁿʣaị̈.ɲã]	sprinkle
	c.	/**ʦʰ**ai-ɲã/	[ʦʰaị̈-ɲã]	heavy-CAUS

The post-alveolar affricates are voiceless unaspirated /ʧ/, voiceless aspirated /ʧʰ/, and prenasalized /ⁿʤ/. These are shown to be distinct phonemes in (18)-(20), which show the contrast between /ʧ/ and /ʧʰ/ in (18), between /ʧ/ and /ⁿʤ/ in (19), and between /ʧʰ/ and /ⁿʤ/ in (20).

(18)	a.	/**ʧ**i.**ʧ**i/	[ʧi.ʧi]	let go
	b.	/**ʧʰ**i.**ʧʰ**i/	[ʧʰi.ʧʰi]	cut
(19)	a.	/ãʔ.**ʧ**o/	[ãʔ.ʧo]	search for food for a domesticated animal
	b.	/ãʔ.**ⁿʤ**o/	[ãʔ.ⁿʤo]	play the panflute, dance
(20)	a.	/**ʧʰ**o/	[ʧʰo]	stir
	b.	/**ⁿʤ**o/	[ⁿʤo]	fear

3.2.1.4. Fricatives

A'ingae displays four fricative phonemes: labio-dental /f/, alveolar /s/, post-alveolar /ʃ/, and glottal /h/. These are contrasted in pairs in (21)-(26): /f/ and /s/ in (21), /f/ and /ʃ/ in (22), /f/ and /h/ in (23), /s/ and /ʃ/ in (24), /s/ and /h/ in (25), and /ʃ/, and /h/ in (26).

(21)	a.	/**f**e.tʰa/	[fe.tʰa]	open
	b.	/**s**e.tʰa/	[se.tʰa]	sing, song
(22)	a.	/**f**õ.ⁿdo/	[fo.ⁿdo]	scream
	b.	/**ʃ**õ.ⁿdo/	[ʃõ.ⁿdo]	witness
(23)	a.	/**f**aʔ.ʧo/	[faʔ.ʧo]	type of tree
	b.	/**h**a=ʔʧo/	[ha.ʔʧo]	go=SUB
(24)	a.	/**s**ãʔ=kho/	[sãʔ.kho]	dry=CLF:ang
	b.	/**ʃ**ãʔ.kho/	[ʃãʔ.kho]	deer
(25)	a.	/**s**iʔ.mã/	[siʔ.mã]	ripe fruit
	b.	/**h**i=ʔmã/	[hi.ʔmã]	come=FRT
(26)	a.	/**ʃ**a.**ʃ**a/	[ʃa.ʃa]	ornamental seed
	b.	/**h**a=**h**a/	[ha.ha]	go=IMP

Borman (1962) distinguishes a voiced velar fricative /ɣ/, which he represents as /g̷/. We follow Repetti-Ludlow et al. (2019) in identifying it as a velar approximant /ɯ̟/. Its phonemic status is evident from minimal pairs such as those in (27)-(28).

(27)	a.	/ʧi.**ɯ̟**a/	[ʧi.ɯ̟a]	God
	b.	/ʧi.**tʰ**a/	[ʧi.tʰa]	tear
(28)	a.	/e.**ɯ̟**a/	[e.ɯ̟a]	bad
	b.	/e.**ɾ**a/	[e.ɾa]	clam

3.2.1.5. Nasal consonants

Three nasal consonants have been identified in A'ingae: labial /m/, alveolar /n/, and palatal /ɲ/. The set of examples in (29)-(31) demonstrates their phonemic status: /m/ and /n/ are contrasted in (29), /m/ and /ɲ/ in (30), and /n/ and /ɲ/ in (31).

(29)	a.	/**m**ã=nẽ/	[mã.nẽ]	IGN.SEL=SO
	b.	/**n**ã.nẽ/	[nã.nẽ]	surely
(30)	a.	/mã.**m**ã/	[mã.mã]	mother
	b.	/mã.**ɲ**ã/	[mã.ɲã]	send
(31)	a.	/mã=**n**ĩ/	[mã.nĩ]	IGN.SEL=LOC
	b.	/mã.**ɲ**ĩ/	[mã.ɲĩ]	how many

In (32) all three consonants are in opposition:

(32)	a.	/**m**ã=nĩ/	[mã.nĩ]	IGN.SEL=LOC
	b.	/**n**ã.nĩ/	[nã.nĩ]	finish
	c.	/**ɲ**ã=nĩ/	[ɲã.nĩ]	1.SG=LOC

3.2.1.6. Flaps

The flap /ɾ/ also has phonemic status in A'ingae. As this is the only flap in A'ingae, we contrast it here with other alveolar phonemes in the language.

(33)	a. /a.**ɾ**a.pa/	[a.ɾa.pa]	chicken
	b. /a.**t**a.pa/	[a.ta.pa]	increase
(34)	a. /**ɾ**a.pi-ã/	[ɾa.piã]	pencil-CAUS
	b. /**s**a.pe-ã/	[sa.pi̯ã]	flat-CAUS
(35)	a. /**ɾ**ã.^{n}de/	[ɾã.^{n}de]	big
	b. /**n**ã=^{n}de/	[nã.^{n}de]	meat=RPRT

In (33) the flap is contrasted with the plosive alveolar /t/, in (34) with the fricative alveolar /s/, and in (35) with the nasal alveolar /n/.

3.2.1.7. Approximants

We identify three approximants in the language: labio-dental /ʋ/, palatal /j/, and velar /ɰ/. The first to are shown in opposition in (36).

(36)	a. /to.**ʋ**a/	[to.ʋa]	throw
	b. /to.**j**a/	[to.ja]	still

Velar /ɰ/ occurs very little in the language. Restrictions on its occurrence are discussed in Section 2.4. It is not found in opposition with other approximants or velars, but its phonemic status is clear from examples (27) and (28) above, repeated here as (37) and (38).

(37)	a. /ʧi.**ɰ**a/	[ʧi.ɰa]	God
	b. /ʧi.**t^{h}**a/	[ʧi.t^{h}a]	tear
(38)	a. /e.**ɰ**a/	[e.ɰa]	bad
	b. /e.**ɾ**a/	[e.ɾa]	clam

3.2.2. Vowels

3.2.2.1. Introduction

A'ingae has five oral and five nasal vowels (Table 3.2). Each set consists of 2 front vowels, 2 central ones and a back vowel. A formant analysis in Repetti-Ludlow et al. (2019) confirms this distribution. The /o/ and /õ/ have broad ranges of manifestations, ranging from [o] to [ʊ], and from [õ] to [ʊ̃].

Table 3.2. Vowels

	front	central	back
close	/i/, /ĩ/	/ɨ/, /ɨ̃/	
mid	/e/, /ẽ/		/o/, /õ/
open		/a/, /ã/	

3.2.2.2. Oral versus nasal vowels

In the following examples oral and nasal vowels articulated at the same place of articulation are contrasted.

- close front vowels /i/ and /ĩ/:

(39)	/h**i**/	[hi]	come
	/h**ĩ**/	[h**ĩ**]	exist

- mid front vowels /ɛ/ and /ɛ̃/:

(40)	/=k^{h}**e**/	[k^{h}e]	also
	/k^{h}**ɛ̃**/	[k^{h}ɛ̃]	thus

- close central vowels /ɨ/ and /ɨ̃/:

(41)	/h**ɨ**/	[hɨ]	fine
	/h**ɨ̃**/	[hɨ̃]	yes

- open central vowels /a/ and /ã/:

(42)	/**a**.si/	[a.si]	pull out
	/**ã**.si/	[ã.si]	salt

- mid back vowels /o/ and /õ/:

(43)	/h**o**/	[ho]	DIST.LOC
	/h**õ**/	[hõ]	sow

3.2.2.3. Place oppositions in oral vowels

In the following examples oral vowels are contrasted with respect to their closeness.

- close front /i/ vs. mid front /e/:

(44)	a. /**i**.h**i**/	[i.hi]	armadillo
	b. /**e**.h**e**/	[e.he]	impale

- close central /ɨ/ vs. open central /a/:

(45)	a. /**ɨ**ke/	[ɨke]	cacique
	b. /**a**ke/	[ake]	warm

The next set of examples shows distinctions in terms of backness of oral vowels.

- close front /i/ vs. close central /ɨ/:

(46) a. /i=s**i**/ [i.si] bring=DS
b. /i.s**ɨ**/ [i.sɨ] take

- mid front /e/ vs. mid back /o/:

(47) a. /t**e**.ʊa/ [te.ʊa] paint
b. /t**o**.ʊa/ [to.ʊa] throw

Some mixed further oppositions are illustrated in the following examples:

- close front /i/ vs. open central /a/:

(48) a. /**i**.nã/ [i.nã] cry
b. /**a**.nã/ [a.nã] sleep

- mid front /e/ vs. open central /a/:

(49) a. /ʦ**e**/ [ʦe] then
b. /ʦ**a**/ [ʦa] that

- close central /ɨ/ vs. mid back /o/:

(50) a. /k^{h}**ɨ**.ʃa/ [k^{h}ɨ.ʃa] recover
b. /k^{h}**o**.ʃa/ [k^{h}o.ʃa] drum

- open central /a/ vs. mid back /o/:

(51) a. /d**a**=ja/ [da.ja] become=IRR
b. /d**o**=ja/ [do.ja] break=IRR

3.2.2.4. Place oppositions in nasal vowels

In the following examples nasal vowels are contrasted with respect to their closeness.

- close front /ĩ/ vs. mid front /ẽ/:

(52) a. /h**ĩ**/ [hĩ] exist
b. /h**ẽ**/ [hẽ] sound

- close central /ɨ̃/ vs. open central /ã/:

(53) a. /k**ɨ̃**^{n}de/ [kɨ̃^{n}de] swallow
b. /k**ã**=^{n}de/ [kã.^{n}de] look=RPRT

The next set of examples shows distinctions in terms of backness of nasal vowels.

- close front /ĩ/ vs. close central /ɨ̃/:

(54)	a.	/h**ĩ**/	[hĩ]	exist
	b.	/h**ɨ̃**/	[hɨ̃]	yes

- mid front /ẽ/ vs. mid back /õ/:

(55)	a.	/h**ẽ**/	[hẽ]	sound
	b.	/h**õ**/	[hõ]	sow

Some mixed further oppositions are illustrated in the following examples:

- close central /ɨ̃/ vs. mid back /õ/:

(56)	a.	/h**ɨ̃**/	[hɨ̃]	yes
	b.	/h**õ**/	[hõ]	sow

- open central /ã/ vs. mid back /õ/:

(57)	a.	/s**ã**.^{m}ba/	[sã.^{m}ba]	dry
	b.	/s**õ**.^{m}bo/	[sõ.^{m}bo]	go out

3.3. Phonological processes

3.3.1. Introduction

The relevant phonological processes in A'ingae are diphthongization, glottal stop insertion, denasalization, and nasalization, the latter occurring in various contexts.

3.3.2. Diphthongization and diphthongal mutations

When two vowels are clustered within a syllable a diphthong is the result. Since there is no phonemic opposition between diphthongs and any of the vowels, diphthongization is considered a phonological process. Repetti-Ludlow et al. (2019) detect the following diphthongs in their data: [ai], [oe], [oa], [oi], [ɨi], and [ao], as well as their nasalized counterparts [ãĩ], [õẽ], [õã], [õĩ], [ɨ̃ĩ], and [ãõ]. Dąbkowski (forthc.b) adds [i̯a] and [ĩ̯ã] and provides indications of the non-syllabic components. A diphthong is thus always either completely oral or completely nasal. When an oral and a nasal vowel are clustered the entire diphthong becomes nasal, as will be shown below. Examples of the 14 diphthongs are given in (58)-(64).

(58)	a.	[a.k^{h}**i̯a**]	just	b.	[e.h**ĩ̯ã**]	attach
(59)	a.	[a.k^{h}**ɨi̯**]	paddle	b.	[k**ɨ̃ĩ̯**.ʦɨ]	so that
(60)	a.	[**ai̯**.pa]	savage	b.	[**ãĩ̯**]	dog

(61)	a.	[ka**o̯**.fa]	cane	b. [**ãõ̯**.nã]	skimmer
(62)	a.	[ʧ^{h}**o̯i**]	never	b. [s**õ̯ĩ**]	tamal
(63)	a.	[a.sɨ.k^{h}**o̯e**]	upriver	b. [a.thɨ.f**õ̯ẽ**]	distribute
(64)	a.	[k^{h}**o̯a**]	pumpkin	b. [kh**õ̯ã**.^{ŋ}gi]	two

Dąbkowski (2019, forthc.b) notes two types of changes in vowel quality in vowel combinations that do not belong to the set illustrated in (57)-(64), which he calls diphthongal mutations. These turn vowel combinations not allowed as diphthongs into legal diphthongs.

The first of these is diphthongal ikavism. In this process 'the vowels *e* /e/ and *û* /ɨ/ undergo raising and fronting when adjacent to *a* /a/ in order to create well-formed diphthongs' (Dąbkowski 2019: 13). Note that this holds for the nasalized counterparts of these vowels as well. He illustrates this with the following examples:

(65)	/iʔ.n**ã-ẽ**/	[iʔ.n**ãĩ̯**]	cry-CAUS
(66)	/^{n}dɨ.s**e-ã**/	[^{n}dɨ.s**ĩ̯ã**]	hang-CAUS
(67)	/aʔ.h**ɨ-ã**/	[aʔ.h**ĩ̯ã**]	vomit-CAUS
(68)	/^{n}ʤẽʔ.^{n}ʤ**e=a**/	[^{n}ʤẽʔ.^{n}ʤ**i̯a**]	paint=SBSTR
(69)	/ĩ.^{n}ʤ**ɨ=a**/	[ĩ.^{n}ʤ**i̯a**]	green=SBSTR

Note that the vowel combinations [ãẽ], [ẽã], [ɨ̃ã], [ea] and [ɨa] are not among the diphthongs listed in (58)-(64), but the combinations resulting from diphthongal ikavism are: [ãĩ̯], [ɨ̃ã], and [i̯a] are possible diphthongs, as shown in (60b), (58b) and (58a), respectively.

The other diphthongal mutation is postlabial raising (Dąbkowski forthc.b), in which the vowel *a* /a/ is raised in sequences of *ai* /ai/ and *ae* /ae/ and its nasalized counterparts when it is preceded by a labial consonant. The sequence /ai/ is then realized as [ɨi̯] and the sequence /ae/ as [o̯e]. The followingh examples illustrate this process (Dąbkowski forthc.b):

(70)	/ko̯ehef**a=i**te/	[ko̯e.he.f**ɨi̯**.te]	summer=CLF:prd
(71)	/sef**a-ẽ**/	[se.f**õ̯ẽ**]	run.out-CAUS

Note that again the vowel combinations [ai] and [ãẽ][2] are not possible diphthongs in A'ingae, whereas the combinations resulting from postlabial raising are: [ɨi̯] and [õ̯ẽ] are possible diphthongs, as shown in (59a) and (63b) respectively.

3.3.3. Glottal stop insertion

As shown in Table 3.1, the glottal stop forms part of the phoneme inventory of A'ingae. However, it is not always phonemic, as a glottal stop may also be inserted by phonological rule. This rule is applied if a sequence of three vowels would otherwise arise. The examples in (72)-(74) all end with the clitic /=a/, which in (72) follows a syllable with a single vowel and in (73) and (74) with two vowels. Only in the latter case a glottal stop is inserted.

(72) /ɲo=ʦhi=a/
[ɲõ.ʦhi̯a]
good=ADJR=SBSTR

[2] The sequence <ae> in the clitic <=ngae> 'MANN' is idiosyncratically realized as either [ɛ] or [əɛ] (Maksymilian Dąbkowski pers.comm.).

(73) /ᵐbia=a/
[ᵐbi̯a.**ʔ**a]
long=SBSTR
(74) /sai=a/
[sai̯.**ʔ**a]
fine=SBSTR

3.3.4. Nasalization

3.3.4.1. Introduction

Nasality is a prominent feature of A'ingae. In the phoneme inventory there are nasal consonants, prenasalized plosives and affricates, and nasal vowels. A number of nasalization processes add to the observed nasality. The relevant processes include the nasalization of the voiceless unaspirated plosives /p/ and /t/ into [ᵐb] and [ⁿd] when following a nasal vowel; the realization of the approximants /ʊ/ and /j/ as [m] and [ɲ] when following a nasal vowel; the nasalization of oral vowels when preceding or following a nasal vowel; the nasalization of oral vowels following nasal consonants; and the nasalization of oral vowels when preceding a prenasalized plosive or affricate. The nasal character of A'ingae is illustrated in example (75).

(75) /ʦa=ʔ.kã=pa=ᵑgi/
[ʦaʔ.kã.ᵐbã.ᵑgi]
ANA=SIMIL1=SS=1
'Because it is like that, I …'

The phonological word in (75) is made up of four morphemes: the anaphoric pro-noun /ʦa/, and the clitics /ʔ.kã/, /pa/ and /ᵑgi/. The clitic /ʔ.kã/ contains the nasal vowel /ã/ which is responsible for the nasalization and voicing of the adjacent /p/ which is thus realized as [ᵐb]. The nasal feature of the enclitic [ᵑgi] spreads backwards to the preceding /a/ which is then realized as [ã].

In this section we will discuss the various nasalization processes one by one. For an extensive treatment of nasalization, see also Sanker & Anderbois (forthc.).

3.3.4.2. Prenasalization of /p/ and /t/

The voiceless unaspirated plosives /p/ and /t/ are prenasalized and thereby voiced when preceded by a nasal vowel. This is demonstrated with two pairs of morphologically complex words in (76) and (77). In (76) both words contain the same subject clitic /=pa/, which in (76a) is preceded by an oral vowel and realized as [pa], while in (76b) it is preceded by a nasal vowel and realized as [ᵐba]. In (77) both words contain the new topic clitic /ta/, which in (77a) is preceded by an oral vowel and realized as [ta], while in (77b) it is preceded by a nasal one and realized as [ⁿda].

(76) a. /ha=pa/
[ha.**p**a]
go=SS

b. /ʦõ=pa/
[ʦõ.**ᵐb**a]
do=SS

(77) a. /ʊa=ta/ b. /haʔ.ɲõ=ta/
[ʊa.**t**a] [haʔ.ɲõ.ⁿ**d**a]
PROX=NEW.TOP now=NEW.TOP

Likewise the interrogative clitic /ti/ is realized as [ti] following an oral vowel (78a), and as [ⁿdi] after a nasal vowel (78b).

(78) a. /a.fa=ti/ b. /ɨ̃.hĩ=ti/
[a.fa.**t**i] [ɨ̃.hĩ.ⁿ**d**i]
speak=INT rain=INT

Note that there are three voiceless stops in Cofán but that only /p/ and /t/ have a prenasalized and voiced allophone. The voiceless velar stop /k/ does not undergo prenasalization plus voicing, as illustrated with the classifier /ki/ in example (79). This is interesting since, as already established, a prenasalized phoneme /ᵑg/ does exist in Cofán.

(79) /ʃɛ̃=ki/
[ʃɛ̃.**k**i]
red.ant=CLF:lnr

In monomorphemic words it is not possible to establish whether the presence of a pre-nasalized voiced consonant ([ᵐb] or [ⁿd]) is the result of spreading of nasality from the previous vowel, or whether the pre-nasalized voiced consonant results in nasalization of the preceding vowel. A case in point is (80):

(80) [ã.ⁿdɛ]
land

However, since there are a few exceptions to the rule discussed here in other monomorphemic words, we may safely assume that the underlying form of (80) already contains the prenasalized consonant. The counterexamples include the following:

(81) [ʦã.**p**i]
forest
(82) [ã.**t**i̯ã]
relative

In (81) the labial voiceless plosive /p/ is not affected by the presence of the preceding nasal vowel /ã/. Similarly, in (82) the nasal vowel /ĩ/ does not affect the alveolar voiceless plosive /t/.

3.3.4.3. Nasalization of /ʊ/ and /j/

The approximants /ʊ/ and /j/ are also affected by the presence of a preceding nasal vowel, and in such circumstances are realized as [m] and [ɲ], respectively, as shown in (83b) and (84b).

(83)	a.	/ʧʰi.ɾi.ɾi̯a=ʊe/	b.	/kõ.sĩ=ʊe/
		[ʧʰi.ɾi.ɾi̯a.**ʊ**e]		[kõ.sĩ.**m**ẽ]
		bird=ACC.IRR		woolly.monkey=ACC.IRR
(84)	a.	/ⁿda=je/	b.	/ʦõ=je/
		[ⁿda.**j**e]		[ʦõ.**ɲ**ẽ]
		become=INF		make=INF

In (83) the irrealis accusative clitic /ʊe/ is attached to words ending in an oral and nasal vowel, respectively. Only in the latter case nasalization to [m] takes place. Similarly, in (84) the onset of the infinitive clitic is only nasalized to [ɲ] when preceded by a nasal vowel, as is the case in (84b). Two other pairs of examples are provided in (85) and (86), now with the affective clitic /=ʔvi/ and the passive suffix /-je/.

(85)	a.	/seʔjo=ʔʊi/	b.	/iʔã=ʔʊi/
		[seʔ.joʔ.**ʊ**i]		[i.ʔãʔ.**m**i]
		sing=AFF		cry=AFF
(86)	a.	/kati-je/	b.	/kɰ̃ẽ-je/
		[ka.ti.**j**e]		[kɰ̃ẽ.**ɲ**ẽ]
		throw.away-PASS		grow.up-PASS

Example (85b) additionally shows that nasalization may exert its effect across a glottal stop, something we will come back to in Section 3.3.4.7.

3.3.4.4. Nasalization of oral vowels preceding a prenasalized consonant

The nasal feature in prenasalized stops (/ᵐb/, /ⁿd/ and /ᵑg/) and affricates (/ⁿʣ/ and /ⁿʤ/) spreads to the preceding vowel. This is best illustrated with polymorphemic words, as in (87). Here the anaphoric pro-noun /ʦa/ is followed by a morpheme without and with a prenasalized consonant onset: the interrogative clitic /=ti/ and the negative polarity clitic /=ᵐbi/. Only in the second case the preceding vowel is nasalized.

(87)	a.	/ʦa=ti/	b.	/ʦ**a**=ᵐbi/
		[ʦa.ti]		[ʦ**ã**.ᵐbi]
		ANA=INT		ANA=NEG

Similarly, in (88) the proximate demonstrative /ʊa/ is followed by a morpheme without and with a prenasalized consonant onset, the locative classifier /=ʔtʰi/ and the dative clitic /=ⁿga/. Again, only in the second case the preceding vowel is nasalized.

(88)	a.	/ʊa=ʔtʰi/	b.	/ʊa=ⁿga/
		/ʊ**a**.ʔtʰi/		/ʊ**ã**.ⁿga/
		PROX=CLF:loc		PROX=DAT

Some further examples illustrating this nasalization process follow. They contain the prenasalized enclitics /=ᵐbe/ 'BEN' (89), /ⁿdekʰɨ/ 'APL' (90), and /ⁿgae/ 'MANN' (91).

(89) /ti.sɨ=^{m}be/
[ti.s**ɨ̃**.^{m}be]
3.SG=BEN

(90) /nã.sɨ=^{n}de.k^{h}ɨ/
[nã.s**ɨ̃**.^{n}de.k^{h}ɨ]
chief=APL

(91) /ʃa.ʊo=^{n}gae/
[ʃa.ʊ**õ**.^{n}gɛ]
canoe=MANN

3.3.4.5. Nasalization of oral vowels following a nasal consonant

Oral vowels nasalize when they follow a nasal consonant. Since syllables and words may not end in a consonant (except for the glottal stop) in A'ingae, this phenomenon can only be demonstrated word internally. Loanword adaptation is in this case a good way to demonstrate the relevance of the proces. In (92) the Spanish proper name *Jaime* is shown to be adapted in A'ingae such that the final vowel is nasal rather than oral. This is clear from the fact that the following associative clitic with the initial voiceless unaspirated stop /p/ is prenasalized, an effect of the preceding nasal vowel.

(92) /hai.me=pa/
[haị̯.m**ẽ**.^{m}ba]
Jaime=ASSOC

Within words it is harder to demonstrate this nasalization proces. Consider the following example:

(93) /ɲo.ɲa=pa/
[ɲ**õ**.ɲ**ã**.^{m}ba]
make=SS

In this example the vowels of the lexical stem both follow a nasal consonant and both are realized nasally. The second one furthermore triggers nasalization of the onset of the same subject clitic /=pa/. One could argue that the lexical stem underlyingly contains two nasal vowels. However, since we have not encountered any stem in which an oral vowel follows a nasal consonant, we will assume that the nasalization process applies within stems as well. A few examples follow.

(94) [m**ãɲĩ**]
how many

(95) [n**õ**ʔɲ**ã**ʔẽ]
noisy

(96) [ɲ**o̰**ãʔm**ẽ**]
truly

Sanker & Anderbois (forthc.) show that vowels preceding nasal consonants are

phonetically nasal as well, but that they are not as fully nasal as vowels following nasal consonants. We have chosen to represent these vowels as oral in phonetic representations.

3.3.4.6. Nasalization of oral vowels following or preceding a nasal vowel

Oral vowels nasalize when following or preceding a nasal vowel. The following examples show nasalization of a following vowel, in all cases the initial or only vowel of a clitic.

(97) /ⁿʤo.ho=hĩ=a/
[ⁿʤo.ho.hĩ̯**ã**]
fear=CLF:lrg=SBSTR

(98) /ʦa=ʔkã=e/
[ʦaʔ.kã**ẽ**]
ANA=SIMIL1=ADVR

(99) /ʧã=iʔ.kʰɨ/
[ʧã.ĩ̯ʔ.kʰɨ]
mother=INSTR

(100) /mẽʔĩ=ʔo/
/mẽ.ʔĩ.ʔ**õ**/
NEG.PRED=AUG

Nasalization of a preceding vowel is illustrated in the next set of examples. In each case nasalization is triggered by the causative suffix, nasal itself.

(101) /khɨ.ʃa-ẽ/
[khɨ.ʃã̯̃]
recover-CAUS

(102) /so.ᵐbo-ẽ/
[so.ᵐb**õ̯**ẽ]
emerge-CAUS

(103) /hã.ⁿgi-ã/
/hã.ⁿg**ĩ̯**.ã/
arise-CAUS

These examples also show that diphthongs must be either completely oral or completely nasal.

3.3.4.7. The domain of nasalization

Nasalisation of vowels applies within syllables but may cross a syllable boundary when a nasal vowel and non-nasal vowel are separated by the glottal stop /ʔ/, the glottal fricative /h/, or both. These three situations are illustrated in (104)-(109).

In (104) and (105) the augmentative clitic forms a syllable with the glottal stop as its onset. This onset does not block nasalization of the oral nucleus /o/.

(104) /ho.ʊa=ʔkã=ʔo/
[ho.ʊaʔ.kã.ʔ**õ**]
DIST=SIMIL1=AUG

(105) /ʦaʔ.kã=ʔo/
/ʦaʔ.kã.ʔ**õ**/
THUS=AUG

In (106) and (107), the oral nuclei of two suffixes with the glottal fricative /h/ as their onset similarly nasalize under the influence of the nasal nucleus of the preceding syllable.

(106) /kõẽ-hi/
[kõ̰ẽ.h**ĩ**]
grow-PRECUL
(107) /te.ʊãẽ=he/
[te.ʊãḭ̃.h**ẽ**]
write=CLF:flt

Both the glottal stop and the glottal fricative separate a nasal and an oral vowel in (108) and (109), but their presence is no impediment for the nasalization of the nucleus of the suffix /ʔ.he/.

(108) /o.tãẽ-ʔ.he/
[o.tãḭ̃ʔ.h**ẽ**]
cook-IMPF
(109) /ʦõ-ʔ.he/
[ʦõʔ.h**ẽ**]
do-IMPF

The other types of nasalization may also cross syllable boundaries. Repeating some earlier examples, this can be shown to be the case for the prenasalization of the voiceless unaspirated plosives /p/ and /t/;

(110) /ʦõ=pa/
[ʦõ.^{m}**b**a]
do=SS
(111) /haʔ.ɲõ=ta/
[haʔ.ɲõ.^{n}**d**a]
now=NEW.TOP

for the nasalization of the approximants /ʊ/ and /j/;

(112) /kõ.sĩ=ʊe/
[kõ.sĩ.**m**ẽ]
woolly.monkey=ACC.IRR
(113) /ʦõ=je/
[ʦõ.**ɲ**ẽ]
make=INF

for the nasalization of oral vowels when preceding a prenasalized consonant;

(114) /ʦa=^{m}bi/
[ʦ**ã**.^{m}bi]
ana=NEG

and for the nasalization of oral vowels when following a nasal consonant.

(115) /hai.me=pa/
[haɨ̯.m**ẽ**.^{m}ba]
Jaime=ASSOC

Though the nasalization rules thus generally apply within a syllable or across one syllable boundary, the percolating effect of the different nasalization rules may lead to nasalization effects across several syllable boundaries. In (115), for instance, the /e/ is nasalized as it follows a nasal consonant, and subsequently triggers the prenasalization of the onset of the following syllable. Another example is (116):

(116) /ɲo.ɲa=je=ta/
/ɲõ.ɲã.ɲẽ.^{n}da/
make=INF=NEW

Here the nasal consonants in the stem /ɲo.ɲa/ trigger nasalization of both vowels within the stem from /o/ and /a/ into [õ] and [ã]. The resulting nasal vowel [ã] in the second syllable of the stem triggers nasalization of the following approximant /j/ into [ɲ]. The latter triggers nasalization of the following oral vowel /e/ into [ẽ]. In turn, this nasal vowel triggers prenasalization of the following plosive /t/ into [^{n}d].

3.3.5. Partial denasalization

Borman (1962) and Tobar Gutiérrez (1995) assume the presence of voiced plosives and affricates in the consonant inventory of A'ingae, which would then be prenasalized in word-internal onset position when following a nasal vowel. This analysis is problematic, however, especially since there are several highly frequent clitics in the language that are systematically realized with a prenasalized onset. For instance, the dative clitic /=^{ŋ}ga/, the beneficiary clitic /=^{m}be/, and the animate plural clitic /=^{n}dek^{h}ɨ/ never occur in non-prenasalized form. Acoustic measurements reported on in Repetti-Ludlow et al. (2019) confirm the prenasalized nature of the voiced stops and affricates, as these turn out to be prenasalized even in word-initial position, though with a lower intensity and a shorter duration than in word-medial position. This latter property may be responsible for the fact that in the community orthography prenasalized consonants in word-initial position are written without the nasal prefix that they receive in other positions (see Section 3.5).

To demonstrate that prenasalized consonants are phonemic, we need examples of contrasting morphologically complex forms in which in one case nasality spreads backwards to an underlying oral vowel and in another does not display such nasal spreading. Such examples are shown in (117) with the verbal form /ʃa.ka/ 'fail, lack' for the prenasalized labial plosive /^{m}b/.

(117) a. /ʃa.ka=pa/ b. /ʃa.ka=^{m}bi/
[ʃa.ˈk**a.**pa] [ʃa.ˈk**ã**.^{m}bi]
fail=SS fail=NEG

In (117a) the verb is followed by the same subject clitic /=pa/, which has a voiceless onset consonant, hence there is no spreading of nasality. In (117b) the same verb form is followed by the negation clitic /=^{m}bi/, and in this case the nasal feature of /=^{m}bi/ spreads backward to the previous vowel, as can be observed in the surface form [ʃa.ˈkã.^{m}bi]. These examples clearly show that prenasalized segments instigate the nasal spreading and therefore must be prenasalized phonemes.

Similar examples for the prenasalized plosives /^{n}d/ and /^{ŋ}g/ are given in (118)-(119).

(118) a. /dɨʃɨ=ha/ b. /dɨʃɨ=^{n}dek^{h}ɨ/
[dɨ**ʃɨ**=ha] [dɨ**ʃ̃ɨ**=^{n}dek^{h}ɨ]
child=CONTR child=APL
(119) a. /ki.ni.k^{h}o=ʊe/ b. /ki.ni.k^{h}o=^{ŋ}ga/
[ki.nĩ.k^{h}**o**=ʊe] [ki.nĩ.k^{h}**õ**.^{ŋ}ga]
tree=ACC.IRR tree=DAT

Thus, rather than positing a rule of nasalization of voiced plosives and affricates, there is rather evidence for a rule of partial denasalization of prenasalized plosives and affricates in word-initial onset position. The nasality of the vowel preceding the prenasalized consonant in non-initial position is then accounted for by the nasalization rule discussed in Section 3.3.4.4.

Since voiced plosives and affricates in word-initial position are only partly denasalized, we represent them as prenasalized in phonetic representations in word-initial position.

3.4. Phonotactics

A syllable consists minimally of a simple vocalic nucleus and maximally of a single consonant as the onset, two diphthongizing vowels as the nucleus, and a glottal stop as the coda, the glottal stop being the only coda allowed, and only if followed by a consonantal onset. If the nucleus consists of two diphthongizing vowels and either one is nasal, both are realized nasally. It follows from the preceding that there are no consonant clusters in A'ingae. The possible sylable structures can therefore be listed and illustrated as in Table 3.3.

Table 3.3. A'ingae syllable structures

template	phonetic form	translation	phonetic form	translation
V	[**a**.ʔi]	person	[**ɨ̃**.hĩ]	rain
VV	[**aɪ̯**.je.he]	push	[**ãĩ̯**]	dog
CV	[a.**ʔi**]	person	[**ʧã**]	mother
CVV	[**k^{h}o̯a**]	pumpkin	[**kĩ̯ã**]	strong
Vʔ	[**iʔ**.fa]	bring=PLS	[**ãʔ**.fa]	eat=PLS
VVʔ	[**aɪ̯ʔ**.ʊo]	body	[**ãĩ̯ʔ**.fa]	dog=CLF:lat
CVʔ	[**paʔ**.ʧo]	dead	[mã.**ñãʔ**.fa]	send=PLS
CVVʔ	[^{n}**ʤaɪ̯ʔ**.ʧo]	sit=NR	[ã.**nãĩ̯ʔ**.ma]	hammock

There are restrictions on the occurrence of certain phonemes. This concerns the glottal stop /ʔ/ and the velar approximant /ɰ/.

Starting with the glottal stop, it should first be noted that its presence may be the result of glottal stop insertion, as discussed in Section 3.3.3, but it also has phonemic status, as shown in Section 3.2.1.4. Glottal stop insertion occurs when a syllable boundary between a series of three vowels needs to be indicated. It is not needed in this sense in (120) and (121), where the glottal stop is thus clearly phonemic.

(120) /aʔ.ta/
[aʔ.ta]
day

(121) /ʦa=ʔ.kã/
[ʦaʔ.kã]
ANA=SIMIL1

Note the consonant sequences /ʔ.t/ and /ʔ.k/ in these examples, which are split up across two syllables, as consonant clusters are not allowed.

Several clitics begin, morphologically speaking, with a glottal stop followed by another consonant. This initial glottal stop, however, is always realized as the coda of the syllable to which the clitic is attached. This is shown in (122) through (124).

(122) /ʦa=ʔkã/
[ʦa**ʔ**.kã]
ANA=SIMIL1

(123) /mẽⁿde-ʔʧo/
[mẽ.ⁿde**ʔ**.ʧo]
beautiful-CLF:rnd

(124) /pahi=ʔsɨ/
[pa.hi**ʔ**.sɨ]
sick=ATTR

The intial syllable of a word does not have the glottal stop as an onset, nor does the final syllable of a word have it as a coda. Stems do not end in a glottal stop either. As a result, the glottal stop only occurs word-internally, either syllable-finally, when followed by a consonant, as in (120)-(124), or syllable-initially, when followed by a vowel, as in (125)-(129):

(125) /ʦaʔo/
[ʦa.**ʔ**o]
'house'

(126) /saʔa/
[sa.**ʔ**a]
'dog'

(127) /ʦeʔi/
[ʦe.**ʔ**i]
'then'

(128) /ijɨʔɨ/
[ijɨ.**ʔ**ɨ]
'scold'
(129) /boʔe/
[bo.**ʔ**e]
'grow'

Turning now to the velar approximant /ɯ̨/, the restriction on the occurrence of this phoneme too is that it is only found in word-medial position, but in this case it is found syllable-initially only. Furthermore, the number of occurrences of this phoneme is very limited. A few examples follow.

(130) /a.ɯ̨a.t^{h}o/
[a.**ɯ̨**a.t^{h}o]
'number'
(131) /e.ɯ̨a/
[e.**ɯ̨**a]
'bad'
(132) /ɨ.ɯ̨a/
[ɨ.**ɯ̨**a]
'weave'

3.5. Orthography

An orthography for A'ingae was developed in the sixties by M.B. Borman and R.F. Borman and first used in R.F. Borman (1962). The first explicit description can be found in M.B. Borman (1976). From a linguistic point of view, this orthography, though it is systematic, has some less transparent properties. Aspiration of plosives and affricates is shown through reduplication of the consonant, thus [t^{h}] is represented as <tt> and [ʦ^{h}] as <tss>. Furthermore, there are some clear Spanish traits in the orthography, such that a [k] in front of an [e] or an [i] is written <qu>, while it is written <c> in front of other vowels. Combining these two properties, an aspirated [k^{h}] then becomes <qqu> in front of an [e] or an [i] and <cc> in front of other vowels. A telling example of the problems this leads to (Scott Anderbois pers.comm.) is the pair <ccuivo> for [k^{h}ɨiʊo] 'catfish' and <qquipoe'su> for [k^{h}ipoˈeʔsɨ] 'hunger, thirst', where in the first syllable only the vowel differs in pronunciation, but only the consonant in the orthograpy.

A new orthography generally adopted by the A'ingae community solves these problems by using <k> for /k/ and an <h> following a consonant or affricate to show aspiration, thus <kh> for /k^{h}/. Prenasalized consonants are written as a combination of a nasal, partially homorganic, and the relevant consonant, thus <mb> for [^{m}b], <nd> for /^{n}d/, and <ng> for /^{ŋ}g/. In word-initial position, however, these consonants are written without a nasal prefix. A further difference is that the community orthography uses the vowel symbols <a, e, i, u, û> rather than the series <a, e, i, o, u> used in the Borman orthography.

In both the Borman and the community orthography, nasal and nasalized vowels are represented by adding an <n> to the vowel, except when this vowel is preceded or

followed by a nasal consonant or followed by a prenasalized consonant, in which case the <n> is most often dropped. For instance, <adan> is used for [adã] 'Adam', but <aiña> rather then <aiñan> for [aiɲã] 'tame'. In nasal diphthongs the <n> is written only once, following the diphthong as a whole, and only if the diphthong is not preceded or followed by a nasal consonant or followed by a prenasalized consonant. For instance, <ashaen> is the orthographic representation of [aʃãĩ] 'start'. Words borrowed from Spanish and still recognized as being Spanish generally maintain their original orthography, and so are proper names of Spanish origin. An overview of the orthographic manifestation(s) of individual phonemes is given in Table 3.4 for consonants and Table 3.5 for vowels.

Table 3.4. Consonants—orthography

phoneme	orthography	phoneme	orthography	phoneme	orthography
/p/	<p, mb>	/ᵑg/	<ng>	/ⁿʣ/	<nz, z>
/pʰ/	<ph>	/f/	<f>	/ⁿʤ/	<ndy, dy>
/t/	<t, nd>	/s/	<s>	/m/	<m>
/tʰ/	<th>	/ʃ/	<sh>	/n/	<n>
/k/	<k>	/h/	<j>	/ɲ/	<ñ>
/kʰ/	<kh>	/ʦ/	<ts>	/ɾ/	<r>
/ʔ/	<'>	/ʧ/	<ch>	/ʋ/	<v, m>
/ᵐb/	<mb, b>	/ʦʰ/	<tsh>	/j/	<y, ñ>
/ⁿd/	<nd, d>	/ʧʰ/	<chh>	/ɯ̯/	<g>

As regards the orthography of consonants, it should be noted that for the prenasalized consonants two possible realizations are given in Table 3.4: the second of these is the one used in word-initial position. As a result, <g> is used both for /ᵑg/ in word-initial position and /ɯ̯/ in word-medial position. There are also two possible realizations of the approximants /ʋ/ and /j/: the second one of these is the one used when following a nasal vowel, which triggers nasalization to [m] and [ɲ] of these phonemes.

Table 3.5. Vowels—orthography

phoneme	orthography	phoneme	orthography
/i/	<i, in>	/ĩ/	<in, i>
/ɨ/	<û, ûn>	/ɨ̃/	<ûn, û>
/o/	<u, un>	/õ/	<un, u>
/e/	<e, en>	/ẽ/	<en, e>
/a/	<a, an>	/ã/	<an, a>

With respect to the orthography of vowels, underlying oral vowels may surface as nasal ones as the result of nasalization, in which case nasality is shown in the orthography with an <n> following the vowel.

(133) /ʦõ-he/
[ʦõ.hẽ/
<tsunje**n**> *<tsunje>
do-IMPF

(134) /meʔi=ʔo/
[meʔi.ʔõ]
<me'iu**n**> *<me'iu>
NEG.PRED=AUG

The other way around, the final <n> is dropped in otherwise nasal contexts. Some examples of the latter are:

(135) /ĩʔ.hã=^{m}bi/
[ĩʔ.hã.^{m}bi]
<in'j**a**mbi> *<in'janmbi>
think=NEG
(136) /ʊa=mã/
[ʊa.mã]
<vam**a**> *<vaman>
PROX=ACC.REAL

Since in nasal diphthongs the <n> is written only once, following the diphthong as a whole, orthography is as illustrated in (137)-(138):

(137) /ã.kãẽ/
[ã.kãĩ̯]
<ankae**n**> *<ankanen>
assure
(138) /õã.ʔõã/
[õ̯ã.ʔõ̯ã]
<ua**n**'ua**n**> *<unan'unan>
frog

Finally, if the diphthong is preceded or followed by a nasal consonant or followed by a prenasalized consonant, the nasalization of the vowels is not marked at all. These phenomena are illustrated in the following examples:

(139) /sema-ẽ/
[semõ̯ẽ]
<sem**ue**> *<semuen>
kuankuan=ACC
(140) /se.fãẽ=^{m}bi/
/se.fõ̯ẽ.^{m}bi/
<sef**ae**mbi> *<sefaenmbi>
finish=NEG

The orthography in use for the Colombian variety differs in two ways from the one described here. For /ɨ/ and /ɨ̃/ it uses <w> and <w̃n> rather than <û> and <ûn>. Furthermore, the /h/ is written <h> rather than <j>.

From this point onwards we will use regular typeface without angle brackets for orthographic representations in examples.

3.6. Prosody

3.6.1. Introduction

In this section we limit ourselves to a few topics that are particularly interesting as regards A'ingae prososy. A'ingae stress rules are particularly complex, and are discussed in Section 2.6.2. Section 2.6.3. shows that sentence intonation is not used to distinguish different sentence types, but rather helps identify main and subordinate clauses. in Section 2.6.4 we discuss the use of falsetto, another remarkable aspect of A'ingae prosody.

3.6.2. Stress

3.6.2.1. Introduction

Stress in A'ingae was first discussed in Borman (1976: 3), who notes that word stress is generally located on the penultimate syllable of a word, or on the penultimate syllable before a glottal stop within the word; if there is only one syllable in the word, or one syllable preceding the glottal stop, then that syllable will be stressed. Dąbkowski (2021, forthc.a) shows that there are several problems with this analysis, and offers a new analysis, on which we base our current discussion of this phenomenon. Note that the facts presented below align in important ways with the distinction between clitics and suffixes that we will defend in Chapter 4.

3.6.2.2. General patterns

Crucial to the stress system of A'ingae is the distinction between two types of stems: regular stems, without a fixed stress position, and stress-initial stems. The latter group is clearly a minority, and all its members are verbs. Morphosyntactic words based on regular stems have penultimate stress in their basic form, morphosyntactic words based on stress-initial stems have stress on the first syllable (Dąbkowski 2021: 616).

The relevance of the distinction between the two types of stem can be demonstrated by attaching suffixes[3] to disyllabic stems of the two types, as in (141)-(142):

(141)	a. panza	b. panza-ji		
	['pa.^{n}dza]	[pa.'^{n}dza.hi]		
	hunt	hunt-PRECUL		(Dąbkowski 2021: 616)
(142)	a. afa	b. afa-ji		
	['a.fa]	['a.fa.hi]		
	speak	speak-PRECUL		(Dąbkowski 2021: 616)

Stress in morphosyntactic words based on regular stems is penultimate. As a result, in (141a) stress is on the first syllable of the stem, whereas in (141b) the addition of the preculminative suffix leads to a situation in which the second syllable of the stem is stressed. Stress in morphosyntactic words based on stress-initial stems is not affected by the addition of a suffix: in both (142a) and (142b) stress is word-initial.

[3] Below we will show that this only holds for suffixes without an initial glottal stop.

Similar examples, now with tri-syllabic stems, are given in (143)-(144):

(143)	a. upathû	b. upathû-ji		
	[o.'pa.t^{h}ɨ]	[o.pa.'t^{h}ɨ.hi]		
	pick	pick-PRECUL		(Dąbkowski forthc.a)
(144)	a. afase	b. afase-ji		
	['a.fa.se]	['a.fa.se.hi]		
	speak	speak-PRECUL		(Dąbkowski forthc.a)

Stress in (146a) is penultimate, and with the attachment of the preculminative suffix in (143b) penultimate stress is retained by placing it on the final syllable of the stem. In (143b), the addition of the preculminative suffix to the stress-initial stem given in (144a), does not lead to a stress shift.

Some further examples of regular stems with two to five syllables are given in (145)-(148), which show that in all cases stress is penultimate.

(145) panza
['pa.^{n}ʤa]
hunt

(146) injama
[ĩ.'ha.mã]
heart

(147) apechukhû
[a.pe.'tʃo.khɨ]
trousers

(148) khafaisekhuangi
[k^{h}a.faɪ̯.se.'k^{h}o͡ã.ngi]
seven

Further examples of stress-initial stems are listed in (149)-(152). Note that all of these concern verbs, as mentioned above.

(149) afase
['a.fa.se]
'insult'

(150) khurûrû
['k^{h}o.ɾɨ.ɾɨ]
'snore'

(151) uvivi
['o.ʊi.ʊi]
'fill something frequently with sand'

(152) gararakhu
[ˈ^{n}ga.ɾa.ɾa.k^{h}o]
'loose'

Among the stress-initial stems are all glottalized stems, i.e. stems containing a glottal stop. A number of examples given in Dąbkowski (forthc.a) are (153)-(154):

(153) se'je
[s'eʔ.he]
'cure'
(154) akhe'pa
['a.kʰeʔ.pa]
'forget'

Disyllabic glottalized stems have a glottal stop in the rhyme of the first syllable, trisyllabic ones in the second.

Repetti-Ludlow et al. (2019) note the existence of a minimal pair of stems, differing only in the fact that one stem is regular and the other stress-initial:

(155) a. nepi=ye
['nẽ.pi.je]
disappear=INF
'to disappear'

b. nepi=ye
[nẽ.'pi.je]
arrive=INF
'to arrive'

The basic stress rules introduced in this section represent the core of the stress system, but may be overruled by two factors: the attachment of suffixes and the attachment of enclitics. The effects of these factors are discussed in the next sections.

3.6.2.3. Effects of the attachment of suffixes

There are two types of effects on stress assignment caused by the attachment of suffixes. First of all, as noted by Dąbkowski (2021), the fixed stress position in stress-initial stems may be cancelled by a limited number of suffixes, leading to a situation in which they behave like regular stems. This is illustrated for the stress-initial verb *afa* 'speak' in (156) (Dąbkowski 2021: 612, 616):

(156) a. afa
['a.fa]
speak

b. afa-ji
['a.fa.hi]
speak-PRECUL

c. afa-ye
[a.'fa.je]
speak-PASS

Addition of the preculminative suffix in (156b) to the stress-initial stems *afa* in (156a) does not affect the stress position. However, the addition of the passive suffix in (156c) leads to penultimate stress assignment within the morphosyntactic word. The causative suffix (*-en*, *-an*, *-ña*) patterns with the preculminative suffix in not cancelling a word-initial stress position, while the reciprocal (*-khu*) and diminutive (*-kha*) suffixes pattern with the passive suffix.

Secondly, suffixes with an initial glottal stop affect the stress pattern of words based on both regular and stress-initial stems, as they require stress to be placed on the penultimate syllable before the suffix-initial glottal stop. This is illustrated in (157)-(158) for regular stems and in (159)-(160) for stress-initial stems (Dąbkowski forthc.a):

(157)	a.	fûite	b.	fûite-ji	c. fûite-'je
		['fɨi̯.te]		[fɨi̯.'te.hi]	['fɨi̯.teʔ.he]
		help		help-PRECUL	help-IMPF
(158)	a.	upathû	b.	upathû-ji	c. upathû-'je
		[o.'pa.t^{h}ɨ]		[o.pa.'t^{h}ɨ.hi]	[o.'pa.t^{h}ɨʔ.he]
		pick		pick-PRECUL	pick-IMPF
(159)	a.	afase	b.	afase-ji	c. afase-'ñakha
		['a.fa.se]		['a.fa.se.hi]	[a.'fa.seʔ.ñã.k^{h}a]
		offend		offend-PRECUL	offend-REP
(160)	a.	akhe'pa	b.	akhe'pa-ji	c. akhe'pa-'nga
		['a.k^{h}eʔ.pa]		['a.k^{h}eʔ.pa.hi]	[a.'k^{h}e.pãʔ.^{n}ga]
		forget		forget-PRECUL	forget-TRANS

In (157) and (158) the regular stem in the a. examples has penultimate stress. In the b. examples, the addition of the preculminative suffix, without an initial glottal stop, leads to a shift of stress to the penultimate syllablle of the resulting morphosyntactic word. In the c. examples, the addition of the imperfective suffix, with an initial glottal stop, leads to an assignment of stress two syllables to its left. With the stress-initial stems in (159)-(160) the addition of the preculminative suffix in the b. examples has no effect, while addition of the glottal-initial repetitive suffix in (159) and the translocative suffix in (160) deletes the stem initial stress (and glottalization, see Section 3.7.4), after which stress assignment is as in regular stems. The suffixes behaving in this way are the imperfective (-*'je*), semelfactive (-*'ñakha*), cislocative (-*'ngi*), and translocative (-*'nga*) suffixes.

As observed by Dąbkowski (2019, forthc.a), in the case of stems ending in a diphthong followed by a suffix with an initial glottal stop, stress is not on the penultimate syllable preceding the glottal stop but on that diphthong, as illustrated in (161):

(161)	a.	fûndûi	b.	fûndûi-ji	c. fûndûi-'je
		['fɨ.^{n}dɨi̯]		[fɨ.'^{n}dɨi̯.hi]	[fɨ.'^{n}dɨi̯ʔ.he]
		sweep		sweep-PRECUL	sweep-IMPF

This special behaviour of diphthongs can be explained as a result of the fact that they constitute heavy syllables (Dąbkowski 2019, forthc.b).

3.6.2.4. Effects of the attachment of enclitics

The attachment of enclitics also has an effect on stress assignment. As shown by Dąbkowski (2021)[4], clitics are prestressing, i.e. they assign stress to the syllable to their immediate left. Some clitics have this effect with stress-shifting stems only, others have this effect on all stems, i.e. they cancel the stress position of stress-initial verbs.

[4] Note that Dąbkowski (2021) analyzes almost all elements that we consider to be clitics to the predicate phrase as suffixes, calling them outer suffixes, as opposed to inner suffixes, which correspond to our suffixes.

We will first illustrate clitics of the first group. Examples (162)-(163) (Dąbkowski 2019: 46) contain the stress-shifting verb *panza* 'hunt':

(162) a. panza-ji
[pã.'^{n}dza.hi]
hunt-PRECUL

b. panza=ya
[pã.'^{n}dza.ja]
hunt=IRR

(163) a. panza-ji=mbi
[pã.^{n}dza.'hi.^{m}bi]
hunt-PRECUL=NEG

b. panza=ya=mbi
[pã.'^{n}dza.ja.^{m}bi]
hunt=IRR=NEG

In (162a) and (162b) the addition of the preculminative suffix or the irrealis clitic leads to penultimate stress. What is not visible here is that the reasons for this are different in both cases: when the preculminative suffix is attached, the stress assignment is regularly penultimate; when the irrealis clitic is attached, stress is assigned to the syllable preceding it, which happens to be the penultimate one in (162b). This difference is made visible in (163), in which the negative clitic is added. This leads to a change in stress assignment in (163a), in which the stress is carried by the preculminative suffix preceding the negative enclitic. In (163b), however, stress assignment is not affected by the additional clitic, as it is triggered by the first clitic attached to the verb. This shows that when multiple clitics are attached, only the first one has a prestressing effect with this group of clitics.

The fact that in the case of stress-shifting verbs stress assignment is triggered by the first clitic of the clitic string, also explains why polysyllabic clitics do not behave differently from other clitics. This is shown in the following example (Dąbkowski 2019: 46):

(164) a. panza=sa'ne
[pã.'^{n}dza.saʔ.nẽ]
hunt=APPR

In both cases, the stress is antepenultimate rather than penultimate, but is as one would expect when it is the clitic that triggers stressing of the preceding syllable.

Clitics belonging to this group, apart from the irrealis (=*ya*), negative (=*mbi*), and apprehensional (=*sa'ne*) clitics, are, among others, the imperative (=*ja*) and plural subject (=*'fa*) clitics. These clitics do not affect stress assignment in words based on stress-initial stems. This is shown in the following examples (Dąbkowski 2019: 41):

(165) a. upathû
[o.'pa.t^{h}ɨ]
pick

b. upathû=ya
[o.pa.'t^{h}ɨ.ja]
pick=IRR

(166) a. afase
['a.fa.se]
speak

b. afase=ya
['a.fa.se.ja]
speak=IRR

While the attachment of the irrealis clitic =*ya* in (165b) leads to a shift of the stress of the regular stem *upathû* 'pick', this effect is absent from (166b), where the same clitic is attached to the stress-initial stem *afase* 'speak'.

The second group of clitics is different in this respect. Dąbkowski (2021: 620) identifies the diminutive imperative clitic (=*kha*) and the prohibitive clitic (=*jama*) as prestressing clitics

with both regular and stress-initial stems. Consider the following examples with the diminutive imperative clitic (=*kha*) (Dąbkowski 2021: 620):

(167) panza=kha
[pã.'^{n}ʤa.k^{h}a]
hunt=DIM.IMP
(168) ana=kha
[a.'nã.k^{h}a]
sleep=DIM.IMP

The verb *panza* 'hunt' in (167) is a regular verb, the verb *ana* 'sleep' in (168) a stress-initial verb. In both cases stress ends up on the syllable preceding the clitic. Apart from the diminutive imperative clitic (=*kha*), the prohibitive clitic *=jama* shows this same behaviour.

Clitics in this group are furthermore different from the ones in the previous set, in that they systematically assign stress to the syllable preceding them, even if this is a clitic itself. This is shown in (169) (Dąbkowski 2021: 621).

(169) a. panza='fa=jama
[pã.'^{n}ʤa.'ʔfa.ha.mã]
hunt=PLS=PROH
b. ana='fa=kha
[a.nã.'ʔfa.k^{h}a]
sleep=PLS=DIM.IMP

In (169a), with the regular stem *panza* 'hunt', stress is assigned to the syllable preceding the prohibitive clitic (=*jama*), which is itself a clitic, the plural subject clitic (=*'fa*). The same happens in (169b), with the stress-initial stem *ana* 'sleep', in which stress is assigned to the syllable preceding the diminutive imperative clitic (=*kha*), which is again the plural subject clitic.

3.6.3. Sentence intonation

3.6.3.1. Introduction

A typologically rather unusual feature of A'ingae is that prosodic means are not used to distinguish sentence types in terms of their illocutionary values. We demonstrate this in Section 3.6.3.2. A'ingae does make use of intonation to distinguish between main and subordinate clauses. We discuss this feature of A'ingae prosody in Section 3.6.3.3.

3.6.3.2. Sentence intonation and sentence type

Sentence intonation is not used in A'ingae to mark illocutionary distinctions. Declarative, interrogative, imperative, prohibitive, and hortative sentences have the same overall falling prosodic contour. This feature may be licensed by the fact that illocutionary distinctions are expressed through segmental means. Declaratives are unmarked or carry the assertive clitic; polar interrogatives, imperatives, the two types of mitigated imperatives, and prohibitives always carry their respective clitics; content interrogatives contain an ignorative word that is clause-initial or initial in a constituent that is itself clause initial (Dąbkowski forthc.c); and hortatives are introduced by a clause-initial particle. We present examples of each of these sentence types below, followed by pitch tracks showing that all of these have an overall falling

intonation.[5]

(170) *Declarative*
Chanatshia pûshesûma iya.
chana=tshi=a pûshesû=ma i**='ya**
beauty=ADJR=SBSTR woman=ACC.REAL bring=ASS
'He brought a beautiful woman.' [Apicha pûshesû kundasepa 2:10]

(171) *Polar interrogative*
Tayupisû a'indekhûkheti tsa'kaen arukhû kansefa?
tayupi='sû a'i=ndekhû='khe**=ti** tsa='kan=e arroz=i'khû kanse='fa
formerly=ATTR cofán.person=APL=ADD=INT ANA=SIMIL1=ADVR rice=INST live=PLS
'Were the people of long ago living this way, with rice? [Escuela 3:19]

(172) *Content interrogative*
Jenda mañi pûshesû dû'shûveki ambian keja.
jenda **mañi** pûshesû dû'shû=ve=ki a'mbian ke=ja
then IGN.QUANT woman child=ACC.IRR=2 have 2.SG=CONTR
'And how many daughters do you have?' [Escuela 6:18]

(173) *Imperative*
Favatshe ñambe khakejema chathûngaja.
fava=tshi=e ña=mbe khakeje=ma chathû-'nga**=ja**
easy=ADJR=ADVR 1.SG=BEN leaf=ACC.REAL cut-trans=IMP
'Quickly cut leaves for me.' [Apicha pûshesû kundasepa 2:46]

(174) *Mitigated imperative*
Ashaen'se tun'tun.
ashaen**='se** tun'tun.
begin=MIT.IMP uncle
'Uncle, you can start.' [Dyandyakhû 0:08]

(175) *Diminutive Imperative*
Fava'khue ikha khakejema.
fava'khu=e i**=kha** khakeje=ma
easy=ADVR bring=DIM,IMP leaf=ACC
'Please bring the leaves!' [Apicha pûshesû kundasepa 3:41]

(176) *Prohibitive*
Me'i tsenga kambianjama.
me'i tse=nga kambian**=jama**
NEGP ANA.LOC=DAT change=PROH
'Don't change to that side.' [Juego de Mastermind 4 4:57]

(177) *Hortative*
Jinge jaye.
jinge ja-ye
HORT go-INF
'Let's go.' [Day in the community]

[5] Fully glossed examples contain four lines: (i) the orthographic representation, (ii) the morphemic analysis, (iii) the morpheme translation, and (iv) the free translation.

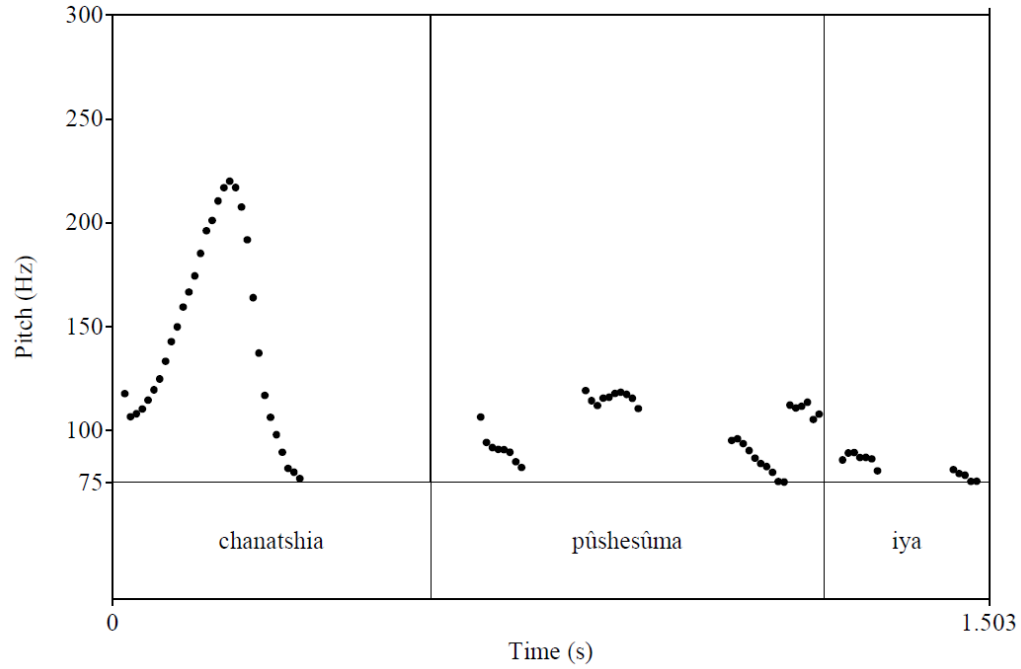

Figure 3.1. Prosodic contour of declarative sentence (170)

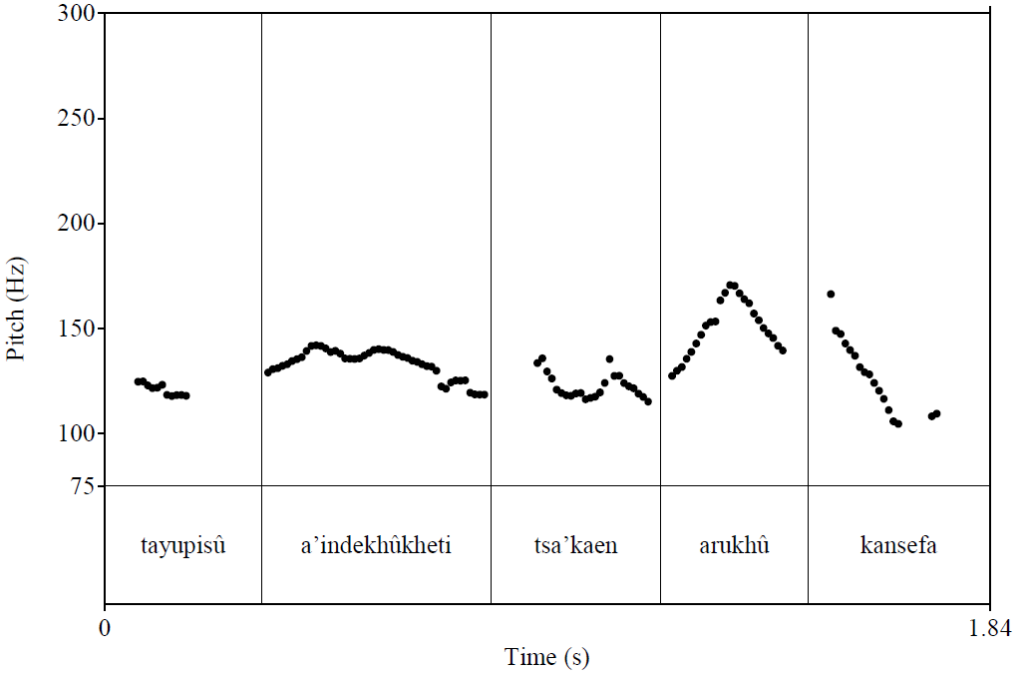

Figure 3.2. Prosodic contour of polar interrogative sentence (171)

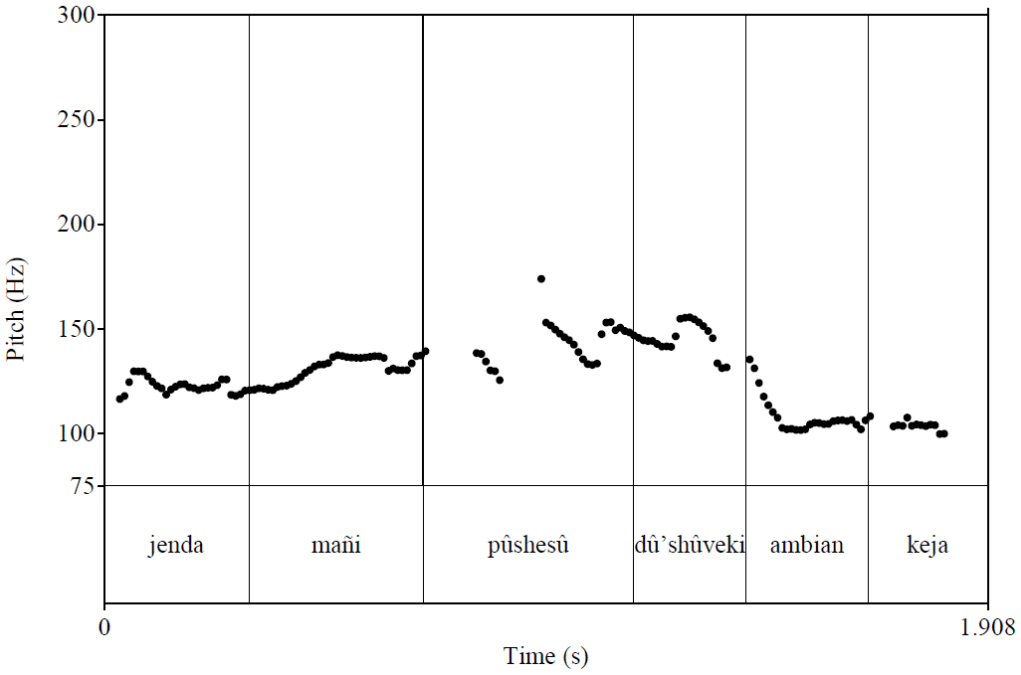

Figure 3.3. Prosodic contour of content interrogative sentence (172)

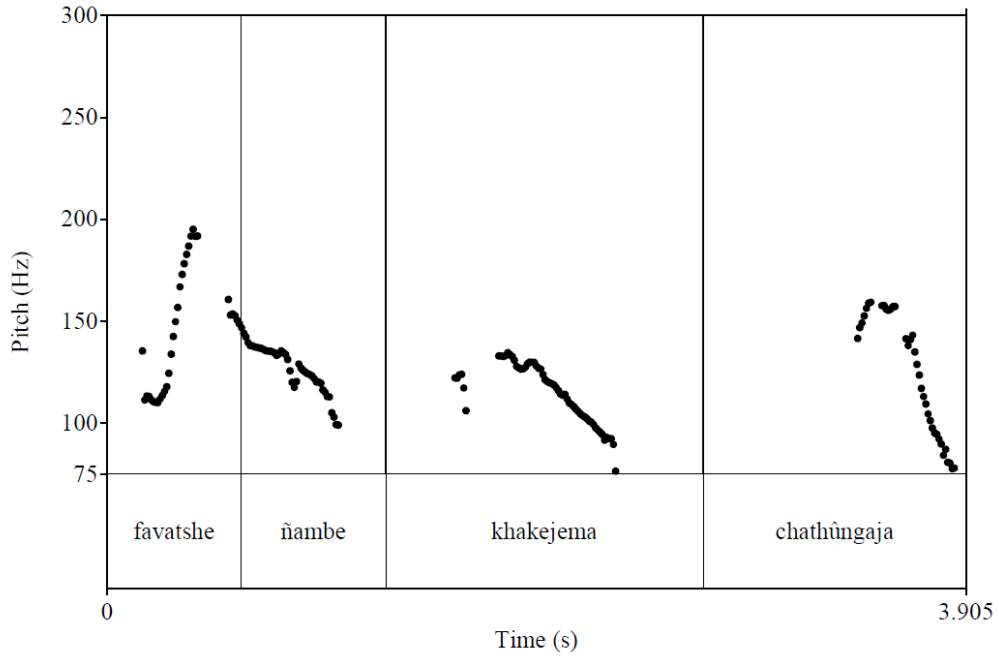

Figure 3.4. Prosodic contour of imperative sentence (173)

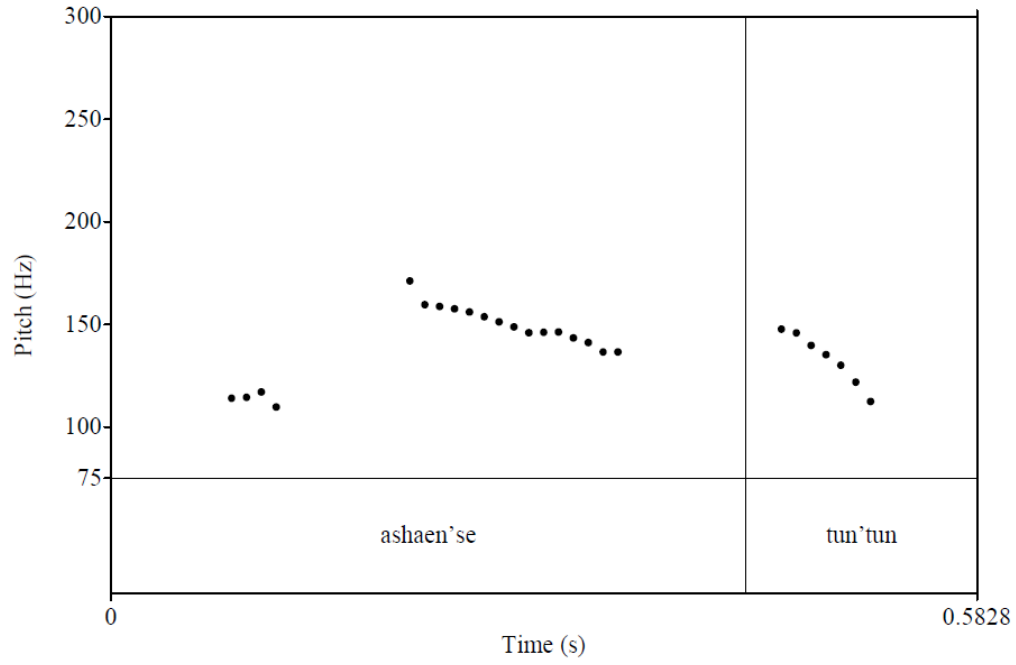

Figure 3.5. Prosodic contour of mitigated imperative sentence (174)

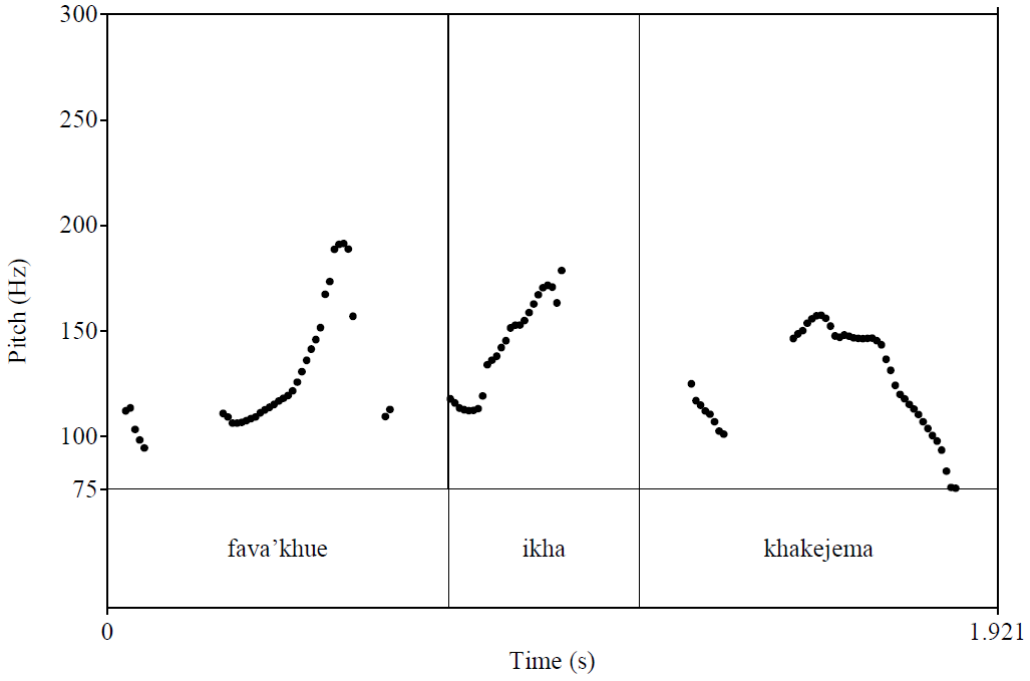

Figure 3.6. Prosodic contour of mitigated imperative (diminutive) sentence (175)

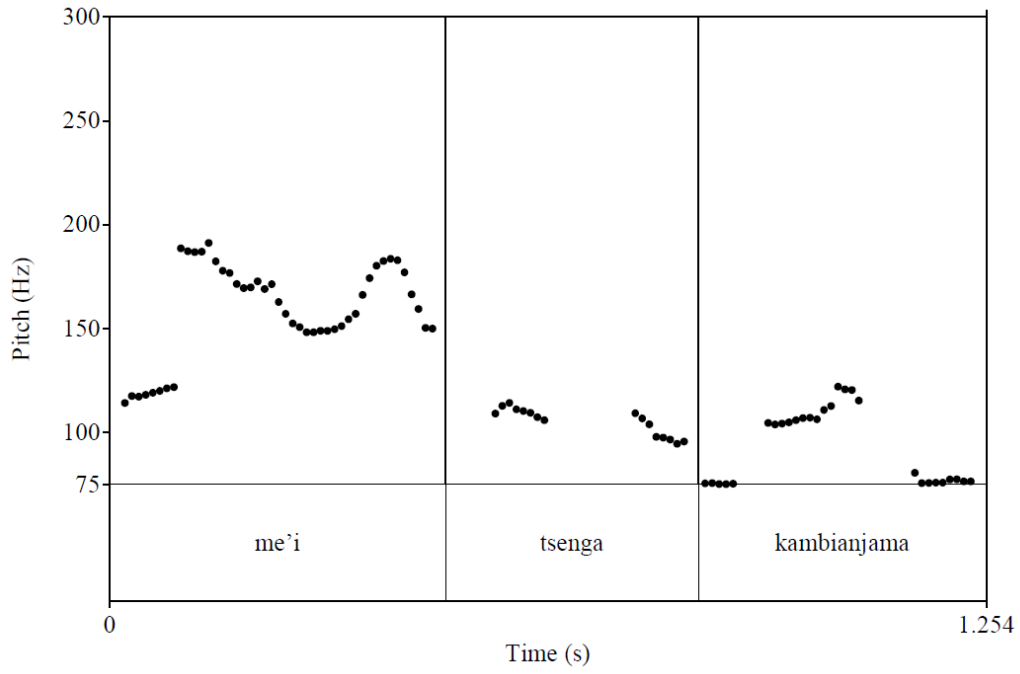

Figure 3.7. Prosodic contour of prohibitive sentence (176)

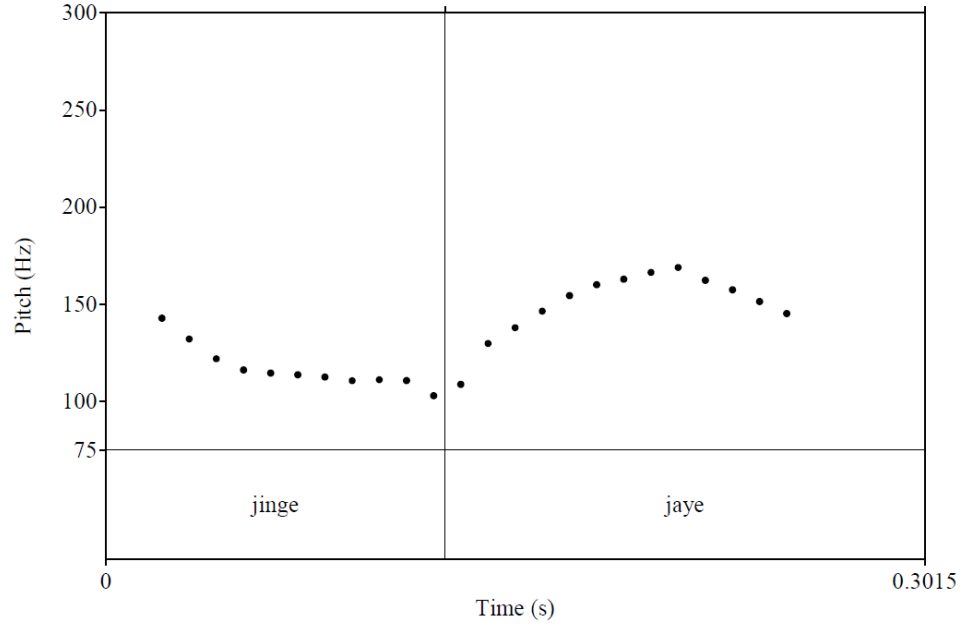

Figure 3.8. Prosodic contour of hortative sentence (177)

3.6.3.3. Sentence intonation and (co-)subordination

A'ingae uses prosodic means to distinguish systematically between main and subordinate clauses. Main clauses have a rising pitch on the penultimate syllable, followed by a slight drop

in pitch at the end of the intonational phrase. In subordinate clauses, high pitch is sustained on the last two syllables of the intonational phrase. This is shown in the prosodic analysis of (178), given in Figure 3.9.

(178) Kanjemba tse nasipama tsa'uñamba nasipave ambianfaya.
kan'jen=pa tse nasipa=ma tsa'u-ña=pa nasipa=ve a'mbian='fa='ya
stay=ss ANA.LOC farm=ACC house-CAUS=SS farm=ACC.IRR have=PLS=ASS
'Staying there and building their farm they were farming.'
[Flor Flanca chiste 0:28 S2]

As can be seen in Figure 3.9, the pitch rises on the two same subject verb forms *kanjemba* 'staying' and *tsa'uñamba* 'building a house', which occupy the final position in their respective cosubordinate clauses. The pitch falls at the end of the clause as a whole, in this case on the sentence-final verb form *ambian'fa'ya* 'they had'.

Example (179) illustrates the same phenomenon, now with a subordinate temporal clause. Again, as shown in Figure 3.10, the pitch rises on the clause-final subordinate verb form.

(179) Tayu chucchupanitsû pa'ya ña yayayeja.
tayu chucchu-'pa=ni=tsû pa='ya ña yaya='ye=ja.
already suck-NR=LOC=3 die=ASS 1.SG father=NPST=CONTR
'My father died when I had breasts.' [Autobiografía of RA 2 0:18]

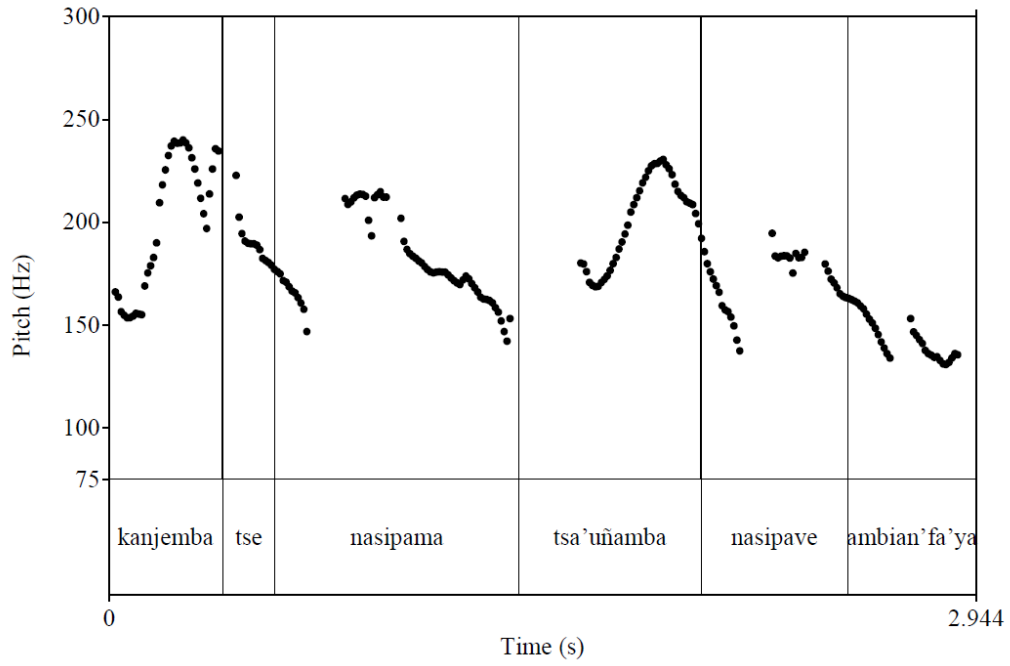

Figure 3.9. Prosodic contour cosubordinate and main clause (178).

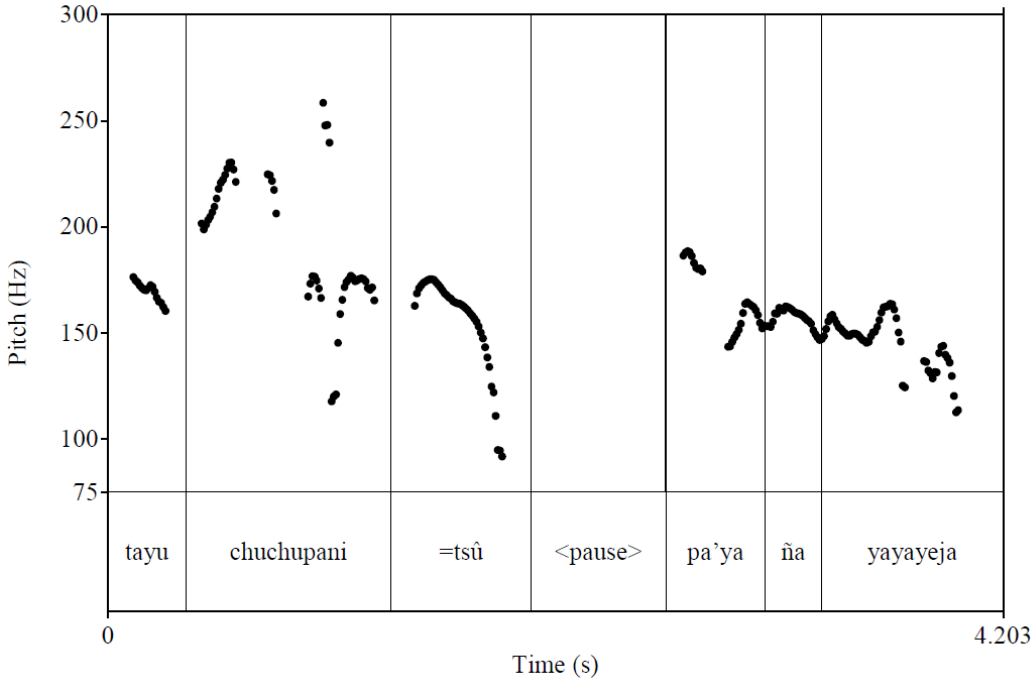

Figure 3.10. Prosodic contour subordinate temporal clause and main clause (179).

A last example concerns of this phenomenon concerns a main clause with a complement clause, given in (180). The pitch track of this example is given in Figure 3.11.

(180) I'namba apichanjan chhu'chhu katitiye ashaenña.

i'na=pa	apicha=ja	chhu'chhu	kati~ti=ye	ashaen='ya
cry=SS	mud=CONTR	IDEO	cast.out~ITER=INF	begin=ASS

'Crying, he began to cast out the mud.' [Apicha pûshesû kundasepa 4:45]

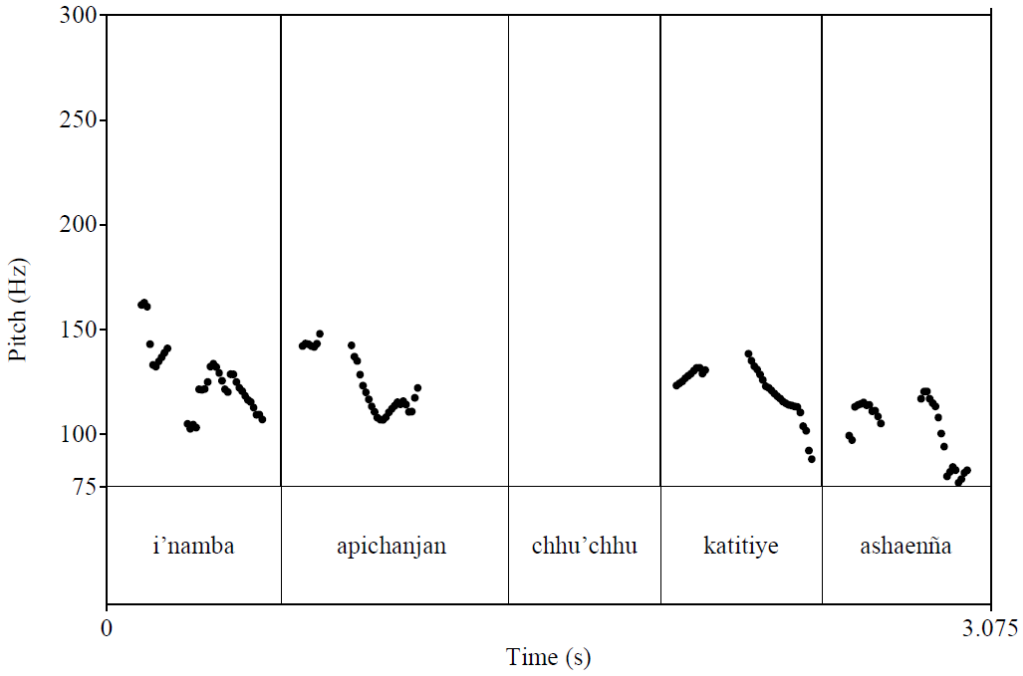

Figure 3.11. Prosodic contour complement clause and main clause (180).

The prosodic distinction between main and subordinate clauses ties in transparently with the clause-chaining strategy that is characteristic of A'ingae, where (co-)subordinate clauses are linked together and end with a main clause (see Section 7.4).

3.6.4. Falsetto

A final aspect of A'ingae prosody to be discussed is the use of falsetto. An account of this phenomenon is provided in Sanker et al. (2018), who note that falsetto is used in A'ingae to express either excitement or perspective shift. These two uses are illustrated in examples (181) and (182), both discussed in Sanker et al. (2018), in which falsetto is indicated by means of the symbol F folllowing the syllable on which it is expressed.

(181) Yushavama tsa kukama kûñan'jeni pandu tsûifa'u jayiya.
yushava=ma tsa kukama kû-ña-'je=ni pandu
iron=ACC.REAL ANA Spaniard burn-CAUS-IMPF=LOC fox
tsûi<F>=fa='u ja-yi='ya
walk<EXCT>=CLF:LAT=AUG go-PROSP=ASS
'When the Spaniard was heating the iron, the fox came walking by.'
[Kuke chiste 2:34]

(182) Paisano, junguesû ki an'jekhen de sû'ya. Thun'thumangi anjenkhenfa'e te sû'ya.
paisano junguesû=ki an-'je khen=te sû='ya
peasant IGN.SBS=2 eat-IMPF QUOT=RPRT say=ASS
thun'<F>thu=ma=ngi an-'je khen fû'e=te sû='ya
naranjilla<PS>=ACC.REAL=1 eat-IMPF QUOT other=RPRT say=ASS
'"What are you eating, peasant?" asked the bear. "I'm eating naranjillas," said the hare.' [Kuke chiste 6:44 S1]

The principal manifestation of falsetto is a higher f0. This is made visible in the pitch tracks of (181)-(182) given in Figure 3.12 and Figure 3.13.

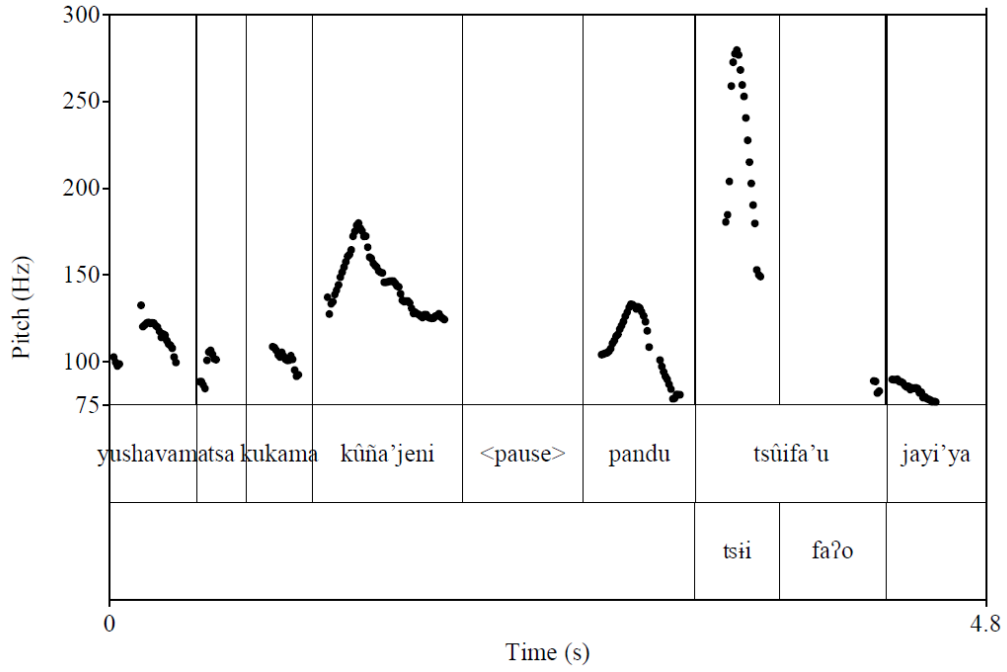

Figure 3.12. Falsetto in (181)

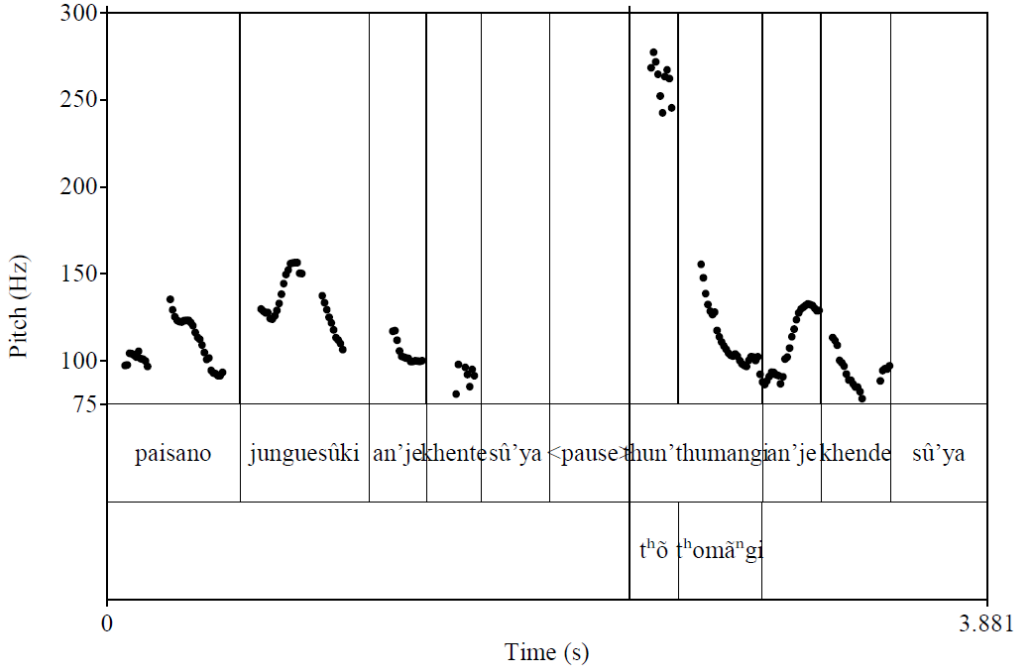

Figure 3.13. Falsetto in (182)

The functions of falsetto will be discussed in Section X on the expression of subjective attitudes and Section X on reported speech.

3.7. Morphophonological processes

3.7.1. Introduction

Morphophonological idiosyncrasies are rare in A'ingae. The most prominent case concerns the causative suffix, which we discuss in Section 3.7.2. Other processes are glottal stop shift (Section 3.7.3), glottal stop deletion (Section 3.7.4), stress shift (Section 3.7.5), and stress deletion (Section 3.7.6). The absence of further morphophonological rules in A'ingae greatly contributes to its overall transparency, discussed in Hengeveld & Fischer (2018a).

3.7.2. The causative suffix

The causative suffix has three different realizations: *-ña* [-ñã], *-en* [-ẽ], and *-an* [-ã]. The rule underlying the choice between the three suffixes is indeed morphophonological in nature, as the choice for one of the allomorphs depends on the phonological type of the stem to which they attach. Following a monosyllabic stem or a two-syllable- stem of the type CV.ʔV the causative suffix is realized as *-ña* [-ɲã], as shown in (183)-(184). If the stem is made up of two or more syllables and its underlying form ends in one of the vowels /i/, /ĩ/, /ɛ/, /ɛ̃/, /ɨ/, or /ɨ̃/, then the causative is realized as *-an* [ã], as illustrated in (185). If the stem is made up of two or more syllables and its underlying form ends in one of the vowels /a/, /ã/, /o/ or /õ/ then the causative is realized as *-en* [ẽ], as exemplified in (186).

(183) dyu-ña
[ʤo.ɲã]
fear-CAUS
'scare'

(184) bia'a-ña
[ᵐbi̯a.ʔa.ɲã]
long-CAUS
'make long'

(185) isû-an
[i.si̯ũ̃ã]
get-CAUS
'record'

(186) chava-en
[tʃa.ʊãĩ̯]
buy-CAUS
'sell'

3.7.3. Glottal stop shift

A second morphophonological rule, the effects of which are noted in Borman (1962), is reponsible for the shift of a glottal stop in a few glottalized stems (Repetti-Ludlow et al. (2019), Dąbkowski forthc.a). This shift is triggered by derivational suffixes only, not by inflectional ones or clitics, as shown in (187)-(188), in which the b-examples contain the preculminative inflectional suffix *-ji*, and the c-examples the causative derivational suffix *-ña*.

(187)	a. kû'i	b. kû'i-ji	c. kûi'-ña
	[kɨ.ʔi]	[kɨ.ʔi.hi]	[kɨ̰ʔ.ɲa]
	drink	drink-PRECUL	drink-CAUS
(188)	a. tsa'u	b. tsa'u=mbi	c. tsau'-ña
	[ʦa.ʔo]	[ʦa.ʔo.^{m}bi]	[ʦao̰ʔ.ɲa]
	house	house=NEG	house=CAUS

3.7.4. Glottal stop deletion

As noted by Dąbkowski (forthc.a), a few suffixes have the effect of deleting the glottal stop in glottalized stems, i.e. a stem containing a glottal stop, even in the presence of intervening suffixes. The suffixes involved are the reciprocal suffix *-khu*, the passive suffix *-ye*, verbal diminutive suffix *-kha*, the imperfective suffix *-'je*, the repetitive suffix *–'ñakha*, the cislocative suffix *-'ngi*, and the translocative suffix *-'nga*. The effect of the addition of these suffixes to glottalized stems is illustrated in (189)-(193), taken from Dąbkowski (forthc.a).

(189) /'seʔ.he-k^{h}a/
[se.'he.k^{h}a]
cure-DIM

(190) /'a.k^{h}eʔ.pa-ẽ-ʔ.hẽ/
[a.k^{h}e.'pãĩʔ.he]
forget-CAUS-IMPF

(191) /'a.k^{h}eʔ.pa-je-ʔ.ɲa.k^{h}a/
[a.k^{h}e.'pa.jeʔ.ɲa.k^{h}a/
forget-PASS-REP

(192) /'seʔ.he-ʔ.^{n}gi/
['se.heʔ.^{n}gi]
cure-CIS

(193) /'a.k^{h}eʔ.pa-ʔ.^{n}ga/
/a.'k^{h}e.paʔ.^{n}ga/
'forget-TRANS'

3.7.5. Stress deletion

As described in Section 3.6.2.3, there are a number of suffixes that trigger the deletion of the stress position in stress-initial stems, after which these behave like regular stems as regards stress assignment. Since this process is limited to a specific group of suffixes, this process is morphophonological in nature. For examples we refer to Section 3.6.2.3. Note that the suffixes involved are the same as those that are responsible for glottal stop deletion, as described in the previous section. For a systematic account of these phenomena, see Dąbkowski (forthc.a).

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