CHAPTER 10: PHONOLOGY

As announced in the Introduction, the grammatical examples have been provided at a level of representation which preserves the phonological identity of morphemes. Said in other words, the linguistic data provided in the grammatical chapters display the concatenation of morphemes before morphophonological rules apply.

In this chapter we will first survey the inventory of phonemic units, their combinatorial rules, and their phonetic realisation. We will then broach the role grammatical information plays in reshaping the phonological make-up of morphemes in words.

1 SEGMENT INVENTORIES

The consonant system comprises 17 segments and is broadly built upon two basic subsystems making a different use of the voice dimension:

1. voiced-stops: **b**, **d**, and sonorants: **m**, **n** / **w**, **y** / **r**, **l**

2. voiceless stops contrasting for aspiration: **p**, **t**, **k** /*vs.*/ **ph**, **th**, **kh**.

The rest of the obstruents are voiceless: an affricate **ts** and two fricatives **s**, **h**.

Synoptically:

(1)

p	**t**	**k**
ph	**th**	**kh**
	ts/s	**h**
b	**d**	
m	**n**	
w	**y**	
	r/l	

The stop subsystem is in the middle of a diachronic process whereby the aspiration is dropped, thugh at a differentiated time rate and with different outcomes depending on two variables: place of articulation and dialects.

(2) **ph** > **ɸ** **th** > **t** **kh** > **χ**

Thus, the de-aspiration of the velar stop and its fricativisation are completed in both Waü and Parawa dialects, ***kh** > **χ**. The same twofold process is on its way regarding the labial stop in the Parawa dialect, where both **ph** and **ɸ** can routinely be heard. In the Waü dialect only the bilabial fricative **ɸ** survives, tending to the labio-dental **f**. Finally, the aspiration of the dental stop is just lost in the Waü dialect, while it is in its initial stage of recession in Parawa, where a dental **t** might however be emerging.

Another difference in consonants obtains between both regions: many Waü words display **l** where we have **r** in Parawa. (The replacement of the vibrant by the lateral characterises the pronunciation of song lyrics in the latter dialect.)

The five-vowel system noticeably displays a third high vowel besides **i** and **u**: an unrounded back vowel **ɯ**. Palatography evidence (Queixalós 1985 85) discloses a tongue placement mid-way between **u** and **w**. Kondo & Kondo (1967) include nasality and length as phonological dimensions of Sikuani vowels. The former is discarded as phonological in Queixalós (1985 28 *ff.*), and is no longer mentioned in Kondo (2001). Length is, at most, peripheral.

(3)

i **ɯ** **u**

e **o**

a

As practical conventions, grammatical examples display **ü** for /**ɯ**/ and **x** for /**χ**/.

2 COMBINATORIAL PATTERNS

Given an obligatory core vowel, here represented **V**, syllables admit up to one peripheral vowel on each side, represented **v**.

(4) (**C**(**v**$_1$)) **V** (**v**$_2$)

V	**peE**	'thorn'
Vv	**Aeba**	'mock'
CV	**bO**	'house'
CVv	**wAi**	'dry season'
CvV	**kuEha**	'fish *sp.*'
CvVv	**piAitahibinɯ**	'drunkard'

An empty **C** position in onset is optionally filled by a phonetic glottal stop. As (4) shows, a pre-core vowel only occurs after a consonant.

Each **V** selects its own set of $\mathbf{v}_2$:

(5)

V	$\mathbf{v}_2$
a	**e**, **i**, **u**, **ɯ**
i	**a**, **o**, **u**
u	**a**, **i**
ɯ	**a**
o	**i**

e as **V** admits no $\mathbf{v}_2$. Falling diphtongs are, thus: **ae**, **ai**, **au**, **aɯ**, **ia**, **io**, **iu**, **ua**, **ui**, **ɯa**, **oi**.

Likewise, selected $\mathbf{v}_1$ are:

(6)

$\mathbf{v}_1$	**V**
i, **u**	**a**
u	**i**,**e**
i	**u**,**o**

ɯ as **V** admits no $\mathbf{v}_1$. Rising diphtongs are, thus: **ia**, **ua**, **ui**, **ue**, **iu**, **io**.

The phonetic difference between segmentally-identical falling *vs*. rising diphtongs is perceptible only in stressed syllables: the core vowel realises the stress, *e.g.* [**kúana**], 'peck', / [**sikuáni**]. Sequences of /$\mathbf{v}_1\mathbf{V}\mathbf{v}_2$/ are unfrequent: only /**iai**/ as in (4) has phonological status as a triphtong. [**uai**, **uei**] appear as mere idiolectal realizations of **oi**.

The phonological structure of morphemes — *i.e*. the lexical phonotactics obtaining inside two morpheme boundaries, formerly accounted in phonological theory by so-called redundancy rules (Stanley 1967) —, imposes restrictions to sequences of consonants in contiguous syllables, in whatever order except for the last sequence below:

(7) no two segments with a fricative component (aspirate, affricate, fricative; a handful of dubious exceptions);

no voiceless stop (aspirate or nonaspirate) in sequence with an homorganic segment consisting of a stop plus a fricative (aspirate, affricate) (a variant of Grassman's law);

no approximant (**w**, **y**) in sequence with an homorganic segment consisting of a stop plus a fricative;

no two voiced stops (**b**, **d**);

no two identical liquids (**r**, **l**);

no nasal followed by an homorganic voiced stop (one possible exception is **mumubito**, 'insect *Sp*.').

As for vowels, either sequences of *different* back vowels (**o**, **u**, **ɯ**) or sequences of *different* high unrounded vowels (**i**, **ɯ**) are disallowed. (Sequences involving **o** seem to be less rigidly banned.) Plausibly a tendency to harmony is — or has been — at work (see **5.3** hereafter). Leaving out the following known exceptions, any contravening sequence contains a morphemic boundary.

***o…u**	**kumo**	'toad *Sp.*'
***o…ɯ**	**tsonɯ**	'anteater'
***i…ɯ**	**matatsinɯ'**	high savanna lands', drifting toward **matatsɯnɯ**.

3 REALIZATION RULES

Follow some unconditionned realizations of segments (~ stands for free or idiolectal variation):

ph → [**ph**] ~ [**ɸ**];

th → [**t**^{h}] ~ [**t**], both dental whereas the phoneme **t** is realized as alveolar (see Queixalós 1985 81 for palatographic evidence);

voiced stops are generally pre-glottalized, **b** less frequently than **d**

the lateral is a retroflex

the vibrant is a rather short apical trill.

We now turn to context-conditionned realizations.

A transitional [^{w}] occurs between a bilabial closure and the high back unrounded **ɯ**:

(8)	**pɯbɯ**	→	[**p**^{w}**ɯb**^{w}**ɯ**]	'ant *Sp.*'
	mɯthɯ	→	[**m**^{w}**ɯthɯ**]	'cave'

The labio-velar approximant looses its back co-articulation between two front vowels:

(9)	**hiwi**	→	[**hiβi**]	'human beings'
	pewi	→	[**peβi**]	'flesh, meat'

The affricate **ts** preceding **i** is palatalized (but not the homorganic fricative **s**).

Coda consonant positions are generated through optional vowel elision in post-stressed vowels (**4** below) occurring between homorganic consonants of which the first is a sonorant and the second an obstruent:

(10)	**'humape**	→	[**húmape**] ~ [**húmpe**]	'soul'
	kasi'balito	→	[**kasibálito**] ~ [**kasibálto**]	'kind of thin shovel"
	a'korososoto	→	[**akórososoto**] ~ [**akórsosoto**]	'a shrimp'

Vowels can be nasalized regressively. This applies more radically to sequences resulting from the **humpe**-type elision, [**hũmpe**], to the point of recovering the syllabic pattern by dropping the nasal consonant, [**hũpe**]. A handful of nasal vowels occur in the absence of any conditioning context. They belong, for the most part, to phonesthetically motivated words, **ũhũwae**, 'Baby!', **ãiãito**, 'ocelot'.

4 STRESS

Stress is generated inside two classes of morphemes: lexical stems and free-standing grammatical forms. Morphemes that do not inherently generate stress are grammatical bound forms, with one possible exception: the case suffix **-'nexa**, target / goal.

With pitch as its phonetic correlate (see Queixalós 1985 106-107 for acoustic evidence), stress is hosted by one of the three last syllables of words (stress zone), exceptionally the

fourth from last, **a'maikatale**. The preferred syllable is second from final and heavy (*i.e.* more than one vowel). The second constraint prevails: **mali'kai**, ***ma'likai**, 'bird *Sp.*', but not without exceptions: **'kophia**, ***ko'phia**, 'anteater *Sp.*' If both constraints coincide on a syllable, this will almost exceptionlessly be stressed: **ma'phauli**, 'grasshopper *Sp.*' (The heavy syllable attraction might also account for stressed syllables out of the stress zone.)

Undeniably, stress is an intricated matter. Kondo (2001) proposes a metrical analysis combining iambic and trochaic feet plus long vowels, which makes the language, along with Yidiny, a rarity among the world's languages (https://wals.info/combinations/17A_16A#2/28.0/148.2, consulted October 24 2020; the same URL consulted in July 2023 displays zero languages).

5 MORPHOPHONOLOGY

A morphophonological process is one that includes grammatical information in the input of the *phonological* rule that accounts for it. Some such processes involve morpheme boundaries, others only stress placement. It is important to keep in mind that the phenomena to be reviewed strictly affect the morpheme classes specified in the rule under discussion. Let us first see the processes bearing on stress loci.

5.1 STRESS SHIFT

In a sequence of morphemes each provided with its *own inherent stress*, the nonfinal stress is phonetically weakened, (11a) (**''** stands for secondary stress). This holds for lexical compounds (chapters **2: THE VERB 2.2.2**, **3: THE NOUN 2.3.3** and **6: VALENCE CHANGES 2.3.5**). However, a few final-position morphemes mid-way between lexical and grammatical status ("light" verbs '**hai**, 'emit a sensorial stimulus, say' and **itsi**, 'do', as well as classifiers and auxiliaries) yield the stress prominence to the preceding element, (b).and

(11) (a) **'mera-hi'tsipa** → **''merahi'tsipa** 'be thirsty'
water-want

(b) **'tsema-'bo** → **'tsema''bo** 'cigar'
tobacco-CYLINDER

' χiu-'hai → **' χiu''hai** 'be sharp'
SoundOfFriction-emit a sensorial stimulus/say

The adding of suffixes that would let the stress too far out of the stress zone results in a rightward shifting. Precisely how far out and how far to the right remains unclear to me.

(12) **'tsikiri-hawa** → **'tsikirihawa** 'small thing'
small-NONANIMATE

but

'tsikiri-hawa-yo → **tsikiri'hawayo** 'very small thing'
small-NONAN-DIM

and

'tsikiri-hawa-behe → **tsikiriha'wabehe** 'two little things'
small-NONAN-DUAL

The augmentative / plural suffix **-nɯ** attracts the stress to the immediately preceding syllabe.

'dunusi-to-nɯ pineapple-SING-AUG	→	**dunusi'tonɯ**	'pinapples / one big pineapple'
itsa-'kuene-hawa-nɯ INDEF/ALTER-acts-NONAN-AUG	→	**itsakueneha'wanɯ**	'bad ways'

The replicative prefix **na-** attracts the verb stress on itself, and in doing so it provides some of the rare instances of a stress located at he left of the stress zone. From chapter **2: THE VERB 2.1.7.2**:

(13) **na-ne-do'pata-ø** → **'nanedopata**
REPLICATIVE-3ACCUSATIVE-HaveSomeoneInhaleYopo-3NOMINATIVE
'He had me inhale yopo too.'

Other changes affecting stress will await for the account of other morpheme sequences below.

5.2 AVOIDING PROSCRIBED VOWEL SEQUENCES

A motley collection of processes involves morpheme boundaries. They mostly consist in having sequences of segments abide by either intramorphemic constraints or syllable templates (**2** above). We start with vocalic changes.

At the hand of plausible extensions of intramorphemic phonotactic constraints — no sequences of different back vowels, no sequences of different high unrounded vowels —, we observe either elision or epenthesis. We see them in this order.

1. The defective verb **hai**, 'say', looses its last vowel when suffixed by speech-act participant nominative-indexes.

(14)

hai-nɯ say-1NOMINATIVE	→	**hanɯ**	'I said (X) to (Y)'
hai-mɯ say-2NOMINATIVE	→	**hamɯ**	'you said (X) to (Y)'

2. The potential disallowed sequences caused by suffixing the plural / augmentative **-nɯ** are dissolved by an epenthetic **a**. No change occurs, however, with **o** as the first vowel.

(15)

bu-nɯ hammock-AUG	→	**buanɯ**	'hammocks'
deha-nɯ-nɯ Piapoco-MASC-AUG	→	**dehanɯanɯ**	'Piapoco men'

liwaisi-nɯ story-AUG	→	**liwaisianɯ**	'stories'
ɯnɯboto-nɯ vine-AUG	→	**ɯnɯbotonɯ**	'vines'
bo-nɯ house-AUG	→	**bonɯ**	'houses'

(See also the 'pineapple' example above.)

5.3 EXTENDING VOWEL HARMONY

This phenomenon, assumed to exist intra-morphemically, might be at work trans-morphemically. It often involves back vowels with an intermediate **h**.

1. Verbs of the **-ane** and the **-ne** groups (*cf.* chapter **2: THE VERB**) simultaneously raise their realis-ending mid-vowel **e** and front the first-person nominative-suffix back-vowel **ɯ**.

(16)	**t-ane-hɯ** see-REALIS-1NOM	→	**tanihi**	'I saw (X)'
	tsutsu-ne-hɯ suck-REALIS-1NOM	→	**tsutsunihi**	'I sucked (X)'

2. The suddenness auxiliary **hopa**, 'fall', spreads regressively its first vowel. In (17a) the change is on the mood ending, in (b) on the converb suffix.

(17) (a)	**pa-ta-hopa** come-REALIS-FALL	→	**patohopa**	'(X) suddenly arrived'
	pi-ta-hopa take-REALIS-FALL	→	**pitohopa**	'(X) suddenly caught (Y) '
	bua-ta-hopa throw-REALIS-FALL	→	**buatohopa**	'(X) suddenly threw (Y) '
(b)	**natae-ya-hopa-rena** visit-CONV-FALL-COMELEVEL	→	**natayohoparena**	'(X) suddenly came to visit'

(For **tae-ya-** → **tayo** in (b), see (26) below.)

3. Likewise, the valence-increasing preverb **ka-**, in both its uses as 'holding' and as plain transitiviser, assimilates its vowel (see chapter **2: THE VERB 2.1.4** for the grammatical gloses of **ka-**).

(18)

ka-horoka HOLDING-pierce	→	**kohoroka**	'(X) stabbed (Y) with an instrument'
ka-hunawa TRANSITIVIZER-BeAfraid	→	**kuhunawa**	'(X) feared (Y)'

4. The singulative suffix **-to** assimilates to **-ti** when preceding the diminutive **-yo**.

(19)

nonohi-to-yo chili-SING-DIM	→	**nonohitiyo**	'one small chili pepper'
dunusi-to-yo pineapple-SING-DIM	→	**dunusitiyo**	'one small pineapple'

Vowel harmony gains psychological reality on account of purported baby talk.

ka-rahu-ta 2ACC-give-REAL	→	**kuruhuto**	'(X) gave (Y) to you'

5.4 SYLLABLE REDUCTION

An inter-morphematic sequence of syllables with homorganic consonants is totally or partially curtailed. The impacted syllable is always the first.

1. At the boundary between the verb and its auxiliary, the verb last-syllable — which corresponds to the mood ending — is deleted altogether, (20). Some intra-dialectal — even intra-idiolectal — fluctuation as to the implementation of this rule is detectable: (21a) and (b) are from adult son and mother, respectively.

(20)

pi-ta-taba take-REAL-INSTANT/SUDD	→	**pitaba**	'(X) took (Y) all of a sudden'
naüko-ta-tsika watch-REAL-COMEDOWN	→	**naükotsika**	'(X) watched down (Y)'
bubu-ta-reka flood-REAL-GODOWN	→	**bubureka**	'it flooded eastward'
bua-ta-ria throw-REAL-GOLEVEL	→	**buaria**	'(X) threw (Y) over there'

(21) (a) **baharapowa** **nawia-ria-ø** (from **nawia-ta-ria**)
ThatWoman return-GOLEVEL-3NOMINATIVE
'That woman went back.'

(b) **na-ebarüto-xata-ta-ria-ø** **müthühawaria**
MIDDLE-tongue-unfold-REALIS-GOLEVEL-3NOMINATIVE IntoTheHole
'It (anteater) introduces its tongue into the hole.'

2. At the boundary between the **-ta**/**-tsi** group verbs and the imperative suffix.

rahu-ta-re → **rahure** 'give (X) to (Y)!'
give-REAL-IMP

3. Through dissimilation, the possessive prefix at all persons erases its **h** before an initial **h**, noticeably that of the nonanimate suffix -**hawa**.

(22)

taha-hawa	→	**tahawa**	'my thing'
niha-hawa	→	**niahawa**	'your thing'
piha-hawa	→	**piahawa**	'his/her thing'
waha-hawa	→	**wahawa**	'our (incl.) thing'
niha-hani	→	**niahani**	'your hunger'

4. The inessive suffix -**ya** drops its consonant after an unstressed vowel if the resulting vowel sequence can turn into an acceptable diphtong. When the preceding vowel is mid, **e**/**o**, the latter further raises to **i**/**u** respectively. The new diphtong attracts the stress.

(23)

'pabi-ya	→	**pa'bia**			'in the garden'
garden-INESSIVE					
'unu-ya	→	**u'nua**			'in the forest'
forest-INESSIVE					
'müthɯ-ya	→	**mü'thɯa**			'in the cave'
cave-INESSIVE					
'mene-ya	→	***menea**	→	**me'nia**	'in the river'
river-INESSIVE					
pe'kototo-ya	→	***pekototoa**	→	**pekoto'tua**	'in the belly'
belly- INESSIVE					

Hiatus reduction consists in letting syllable patterns take control over the vowel sequences brought about by morphemes in contact. This is achieved through the following devices.

1. Deleting the vowel of the intrinsic linkee prefix before divalent nouns with initial vowel, (24a) (a host of restrictions to this rule obtain, particularly regarding kinship terms with second person). In auxiliarisation, deleting the realis mood-ending vowel **a** before an auxiliary with initial vowel (b).

(24) (a)	**ta-aχa** 1INTRINLINK-father	→	**taχa**	'my father'
	ta-opaχa 1INTRINLINK-son-in-law	→	**topaχa**	'my son-in-law'
	pe-aχa 3INTRINLINK-father	→	**paχa**	'his/her father'
	pe-ena 3INTRINLINK-father	→	**pena**	'his/her mother'
	pe-itabara 3INTRINLINK-mandible	→	**pitabara**	'his/her mandible'
	pe-ɯtsɯχɯ 3INTRINLINK-smoke	→	**pɯtsɯχɯ**	'its smoke'
(b)	**mahi-ta-e-ka** sleep-REAL-sit-REAL	→	**mahiteka**	'(X) slept (while sitting or for a long time)'

2. In an allosyllabic sequence of front vowels brought about by auxiliarisation, consonantising the first vowel to approximant **y**.

t-ae-e-ta look-IRR-sit-REAL	→	**tayeta**	'(X) looked at (Y, Y sitting)'
x-ae-e-ka eat-IRR-sit-REAL	→	**xayeta**	'(X) ate (while sitting / for a long time)'

3. Synaeresis. Adjacent allosyllabic vowels are recast according to syllabic patterns through first vowel alteration by means of vowel reduction, (25a), or diphtongation (b). This is most frequent with the future suffix in verbs proper, and with the intrinsic-linkee prefix in divalent nouns, (b) (again, restrictions to this rule involve kinship terms with second person). The rule also applies in noun incorporations, (c).

(25) (a)	**nuk-ae-eka** ^{I}stand-^{I}sit	→	**nukeka**	'(X) stands surreptitiously'
	b-e-ena beat-IRR-FUT	→	**bena**	'(X) will beat (Y)'
	n-ue-ena cry-IRR-FUT	→	**nuena**	'(X) will cry'
	naχüa-nae-ena sing-IRR-FUT	→	**naχüanaena**	'(X) will sing'

(b) **rahu-tsi-ena** → **rahutsiana** '(X) will give (it) to (Y)'
give-IRR-FUT

u-bi-ena → **ubiana** '(X) will sow (it)'
sow-IRR-FUT

pe-opaχa → **piapaχa** 'his/her son-in-law'
3INTRINLINK-son-in-law

pe-owa → **piawa** 'his/her older sister'
3INTRINLINK-OlderSister

(c) **hume-itsi** → **humaitsi** 'say'
sound/speech-do

Independently of hiatus reduction, the front vowel **e** as part of the irrealis ending in verbs of the groups **-pa**/**-pae**, **-ka**/**-kae** and **-na**/**-nae** is absorbed by the palatal approximant of the converb suffix **-ya**.

(26) **naxüa-nae-ya** → **naxüanaya** 'while singing'
sing-IRR-CONV

natae-ya-hopa-rena → **natayohoparena** '(X) suddenly came to visit'
visit-CONV-fall-COMELEVEL

(For **-ya-ho** → **yoho** see (17b) above.)

To wrap up the present section, let us recall that directional auxiliaries trigger intricate morphophonological phenomena, as the sample in (27) shows — with (a) resumed from **2: THE VERB 2.1.9.3.1**. I assume that the complex outputs may be committed to lexical memory as wholes.

(27) (a) **ø-yoro-bi-ena-me-tsina** → **yorobianimina**
3ACCUSATIVE-send-IRREALIS-FUTURE-2NOMINATIVE-COMEUP
'Please send it up to him here!'

(b) **runahopa-bia-bi-ena-ø-tsika** → **runahopabiabianika**
ClimbDownSUDDENLY-DOITERATIVELY-IRREALIS-FUTURE-3NOM-COMEDOWN
'They will climb down suddenly and iteratively.'

(c) **ne-to-kopa-ta-ta-ba-me-tsika!** → **netokopatabaika**
1ACC-INVOLVING-LetGo-REALIS-INSTANT/SUDD-REALIS-2NOM-COMEDOWN
'Unhand it down to me!'

(Paca, from below, to Kinkajou on top of a tree branch holding a pineapple.)

6 SUMMARY

The language features a comparatively simple sound system, phonetically — aspirate stops and preglottalized stops are noticeable yet currently desappearing — and phonologically, with

consonant / vowel inventories and distributional patterns rather modest. Stress — realised as pitch — is phonemic, and located in one of the three last syllables of the word. Morphophonology is more intricate. First, constraints on segment sequences obtaining morpheme-internally have repercussions on the boundaries between contiguous morphemes. Second, vowels tautosyllabically disallowed induce syllable reduction when put in contact by morpheme sequencies. Third, stress placement depends on the classes of morphemes assembled inside the same word, and within the word bundaries the presence of more than one stress-bearing morpheme launches stress hierarchisation.