Swahili

1. [ŋgɔma] 'drum'
2. [bɔma] 'fort'
3. [ŋɔmbe] 'cattle'
4. [bɔmba] 'pipe'
5. [ɔmba] 'pray'
6. [ɔna] 'see'

7. [watoto] 'children'
8. [ndoto] 'dream'
9. [mboga] 'vegetable'
10. [ndogo] 'little'
11. [dʒogo] 'rooster'
12. [ʃoka] 'axe'

What's the simplest rule?

Which allophone has the more restricted distribution?

/o/⟶[ɔ] /__N

Gascon

balo	'ball'
laβo	'she washes'
kambia	'to change'
dunda	'to train'
agraδa	'to please'
bilo	'town'
paβat	'cobblestone'
neβa	'to snow'
gusta	'to taste'
aγγλo	'needle'
akitaw	'thus'

Do the voiced stops or the voiced fricatives have the more restricted distribution?

Voiced Stop --> Voiced Fricative /V__V

$\$^{vd} \rightarrow F^{vd}$ /V__V

Can we say $\$ \rightarrow F$ /V_V? What do we need to know?

$\rightarrow$

Chatino

1. [k̥ata³]   'you will bathe'
2. [kʲ̥isu³]   'avocado'
3. [kʲ̥usu̥ʔwa³] 'you will send'
4. [se̥ʔe²]   'place'
5. [tḁʔa³]   'sibling
6. [kʲ̥uta³]   'you will give'
7. [tḁʔa²]   'fiesta'
8. [nguʃi²] 'tomato'
9. [siyu³]   'juice

10. [laʔa³]   'side'
11. [nguta²] 'seed'
12. [ndikĩ³] 'you are burning'
13. [nguta²]   'seed
14. [tu̥ʔwa²] 'mouth'
15. [tu̥ʔwa³] 'forty'

V→V̥/C̥___C̥   or   V→Vᵛˡ/Cᵛˡ___Cᵛˡ

Osage

1. [dabrĩ]   'three'
2. [datspe]   'to eat'
3. [dakʔe]   'to dig'
4. [dalĩ]   'good'
5. [daʃtu]   'to bite'

6. [aðikhã ʒã]   'he lay down'
7. [tsʔeðe]   'he killed it'
8. [ðeze]   'tongue'
9. [ðie]   'you'
10. [ðuʒa]   'to wash'

/ð/ → [d] /___[a]

Zulu

1. ɓɔna — 'see'
2. ɓɔpha — 'bind'
3. mɔsa — 'despoil'
4. umɔna — 'jealousy'
5. imɔtɔ — 'car'
6. iqɔlɔ — 'small of back'
7. ixɔxɔ — 'frog'
8. isicɔcɔ — 'head ring'
9. isithɔmbe — 'picture'
10. indɔdana — 'son'
11. umfɔkazi — 'strange man'
12. ibokisi — 'box'

13. iɓoni — 'grasshopper'
14. umondli — 'guardian'
15. umosi — 'one who roasts'
16. inoni — 'fat'
17. udoli — 'doll'
18. umxoxi — 'story-teller'
19. imomfu — 'jersey cow'
20. lolu — 'this'
21. isitofu — 'stove'
22. nomuthi — 'and the tree'
23. udodile — 'you acted like a man'

Which variant has the more restricted distribution?

$/ɔ/ \rightarrow [o] / \_\_CV^{high}$

$/ɔ/ \rightarrow [o] / \_\_CCV^{high}$

$/ɔ/ \rightarrow [o] / \_\_CCCV^{high}$

$/ɔ/ \rightarrow [o] / \_\_C(C)(C)V^{high} \ldots$

$/ɔ/ \rightarrow [o] / \_\_C_1 V^{high}$

So far, we've looked at allophonic variation

But phonetic processes can have other consequences.

Consider these data from Gascon

[kotʃ] 'neck'

[kutʃ] 'quiet'

[katʃ] 'fall' 3 sg.

[bibe] 'to live'

[how] 'crazy m'

[huk] 'fire'

[bu]   'good m.'

[milo] 'thousand'

[pyr]   'pure'

[bebe] 'to drink

[balo]   'ball'

[bilo]   'town'

[hiw]   'string'

[bi]   'wine'

[hyk]   'was'

[be]   'well'

[malo] 'bad f.'

[mylo] 'water rat'

What vowel contrasts do we have here?

Here are the vowel phonemes

/i/ /y/ /u/

/e/ /o/

/a/

All of them except /o/ occur after nasals

i ni 'nest'   y nyadʒe 'cloud'   u nuðo 'knot'

e net 'night'   o [   ]

a nas 'nose'

We could just say that /o/ has a defective distribution.
(like English /ŋ/)

How did this come about and how do we talk about it?

Once upon a time, a change happened in this dialecct of Gascon, whereby all occurrences of [o] after nasals raised to [u].

So while /o/ and /u/ have merged after nasals, they are still separate phonemes elsewhere. The distinction between /o/ and /u/ is **neutralized** after nasals.

In many cases, unless we know the history of the word, there's no principled way of knowing whether an [u] occurring after a nasal is an occurrence of the phoneme /u/ or of the phoneme /o/ .

Except … look at the present indicative verbs

	singular	plural
1st person	kant-i	kant-am
2nd person	kant-os	kant-ats
3rd person	kant-o	kant-on

Other third person singular verbs

parlo	'speaks'	panu	'steals'
biro	'turns around'	ajmu	'loves'
kupo	'cuts'	breɲu	'picks grapes'
passo	'goes out'	bramu	'moos'
pago	'pays'	estunu	'surprises'
rodo	'wanders'	gaɲu	'wins'

Look also at masculine and feminine adjectives

	Masculine	Feminine
'full (of drink)'	hart	harto
'false'	faws	fawso
'cool'	fresk	fresko
'calm'	kalme	kalmu
'big'	gran	granu
'yellow'	dʒawn	dʒawnu

In the cases of alternations such as the verb and gender markers we've seen, we can actually see the original phoneme. The third singular verb marker is [o] everywhere except after nasals. So we can call that the underlying form:

'burns'	kram+o
'spoils'	abrim+o
'telephones'	telefun+o
'bathes'	bañ+o
'descends'	abajʃ+o
'drinks'	abewr+o
'swells up'	awhl+o

And we can apply a rule to those underlying forms:

$$o \longrightarrow u \; / \; N\_\_$$

'burns'	kram+o/	kramu	
'spoils'	abrim+o	abrimu	
'telephones'	telefun+o	telefunu	
'bathes'	baɲ+o	baɲu	
'descends'	abajʃ+o	NA	abajʃo
'drinks'	abewr+o	NA	abewro
'swells up'	awhl+o	NA	awhlo

The same rule will work for the feminine marker:

$$o \longrightarrow u \ / \ N\_\_$$
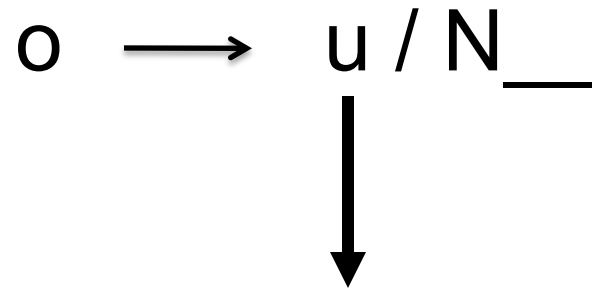
'full of drink'	hart+o	NA	harto
'false'	faws+o	NA	fawso
'cool'	fresk+o	NA	fresko
'big'	gran+o	granu	
'yellow'	dʒawn+o	dʒawnu	
'calm'	kalm+o	kalmu	

We'll briefly consider …

- phonotactic constraints

- a set of features that could be used to describe all languages

- constraints on their occurrence

Syllables

- Speech sounds are organized in syllables.
- Syllable structure differs from language to language
- Syllables consist of
    - Onset   (optional in many languages)
                [sæm]   [æm]

    - Nucleus (obligatory in all languages)
                [sæm]   [fɚm]

    - Coda   (optional or prohibited in most languages)
                [sæm]   [sɔ]

    Not all languages allow consonant clusters in onset and/or coda, and those that do allow different kinds of clusters. Think about what clusters occur in English.

Syllabification

(or, once a coda not always a coda)

[sæməlæwzɪzdɔgtətʃuwɛvriθɪŋ]

[sæ mə læw zɪz dɔg tə tʃu wɛ vri θɪŋ]

- Simple syllables: Hawai'ian
  (C)V(V)
  – 25 Vs, 8Cs

- Complex syllables: English (C)(C)(C)V (C)(C)(C)(C)
  – strengths, split, texts

Feature/Chapter 12: Syllable Structure

by Ian Maddieson

World Atlas of Language Structures
http://wals.info
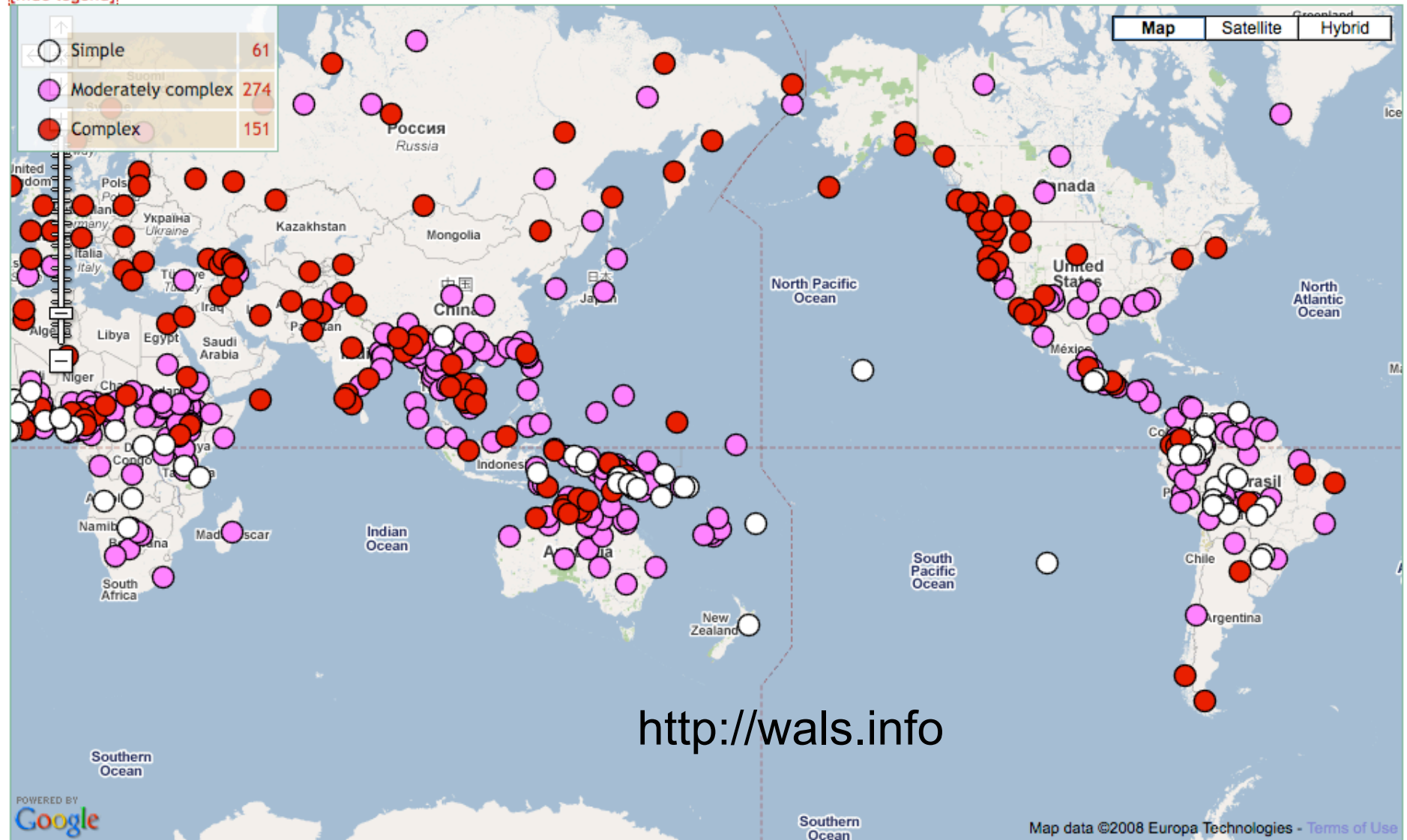
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[hide legend]

○ Simple	61
◔ Moderately complex	274
● Complex	151

http://wals.info

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Phonological systems tend to maximize

- ## Distinctiveness

  The phonemes in a system tend to be maximally distinctive.

- ## Features

  The features that are used in a language tend to be used
  generally

Distinctive features

Basic units of phonological structure

The following features are commonly used. However, the inventory and nature of distinctive features are ongoing theoretical issues.

Class Features

[+/- consonantal]   (oral constriction)

[+/- sonorant]   (resonance vs turbulence)

[+/- syllabic]   (syllable nucleus)

Manner Features

[+/- continuant] (no oral obstruction)

[+/- lateral] (center of tongue touches roof)

[+/- nasal] (velum lowers)

[+/- strident] (high energy white noise)

The beginning of a feature matrix

	plosives	fricatives	nasals	liquids	glides/vowels
[consonantal]	+	+	+	+	-
[sonorant]	-	-	+	+	+
[continuant]	-	+	-	+	+

Laryngeal Features

[+/- voice] (periodic vibration of vocal cords)

[+/- aspirated] (spread glottis)

[+/- glottalic] (constricted glottis)

Place Features

[+/- round]

[+/- high]

[+/- low]

[+/- back]

[+/- tense] ('advanced tongue root')

[+/- anterior] (tip of tongue in front of alveolar ridge)

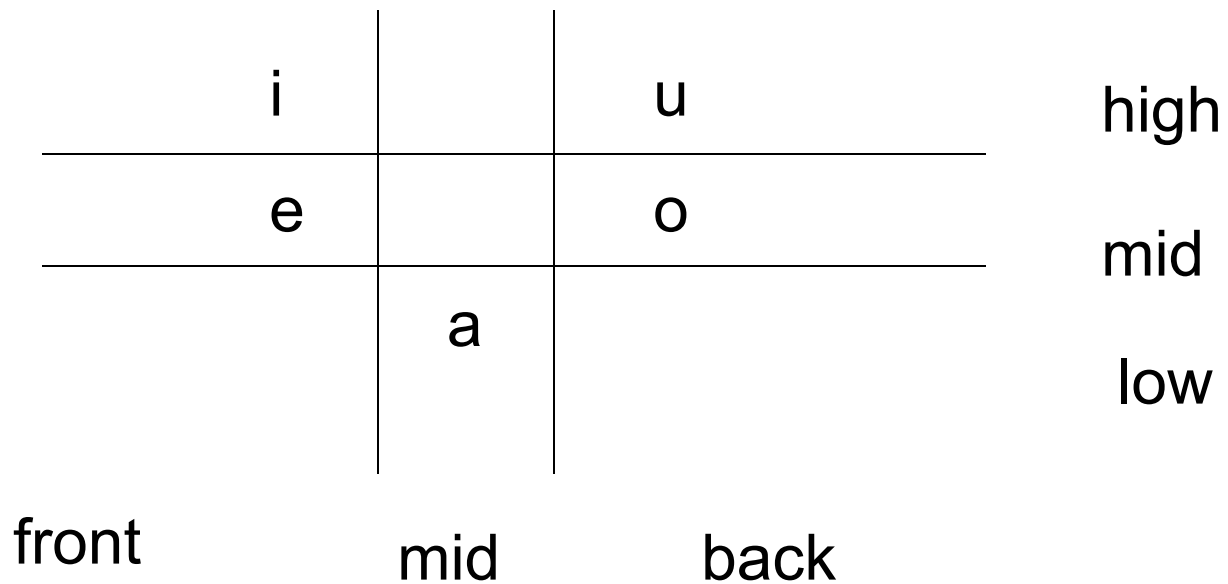[+/- distributed] (tongue extended in mouth)

a common vowel system

```
    i              u

    e              o

         a
```

a common vowel system

i		u	high
e		o	mid
	a		low

front   mid   back

using features

	i		u	
				+ high -low
	e		o	
				- high -low
		a		
				- high +low

- back   +back

What's odd about this consonant system?

p	t	k		p	t	pʰ
b				b	d	bʰ
f	s	x		f	s	
v	z	ɣ		b	z	
m	n	ŋ		m	n	

What's odd about this vowel system?

i　　　ɯ

i　i:　　　　u

e　e:　　　o

a

a

y　　　u

i

ø　　o

e　　　o　　　a

i　　　　ṷ

a　　　 e̥　　　o̥

ḁ
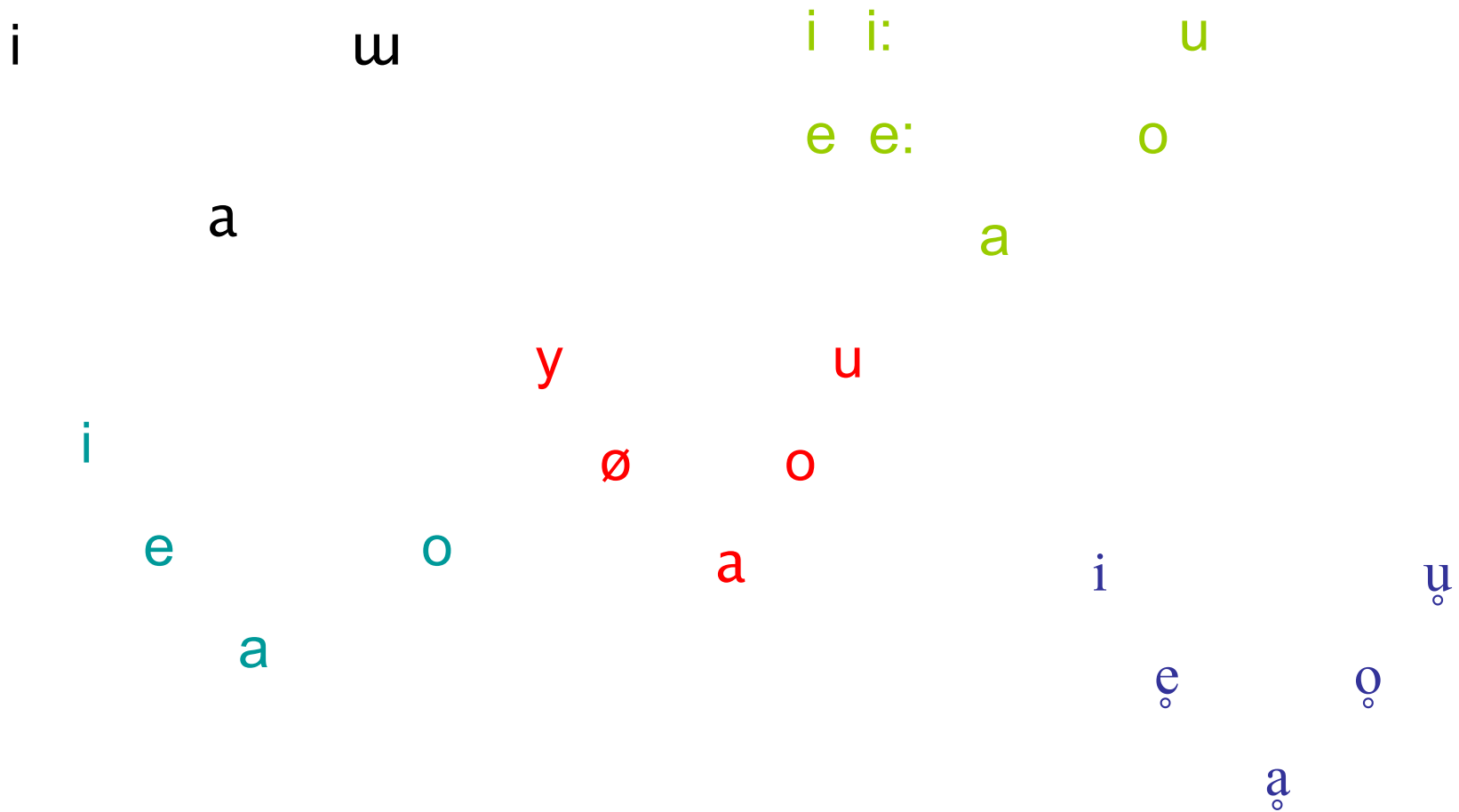
markedness

Certain, unmarked, properties of language are more basic, or natural, than others. They constitute a default.

Marked features
- occur more rarely
- imply the occurrence of the corresponding unmarked feature

i   ỹ   ũ

  ẽ   ø̃   õ

  ã

                          i   y   u

                          e ẽ   ø ø̃   o õ

                                    a ã

Nasalized vowels are
marked