

Chatino

Mexico: Oto-Manguean ~12,000 speakers (all varieties)

- | | |
|--|---|
| 1. [k̡ata ³] 'you will bathe' | 10. [laʔa ³] 'side' |
| 2. [k̡isu ³] 'avocado' | 11. [nguta ²] 'seed' |
| 3. [k̡us̡uʔwa ³] 'you will send' | 12. [ndikĩ ³] 'you are burning' |
| 4. [s̡eʔe ²] 'place' | 13. [nguta ²] 'seed' |
| 5. [t̡aʔa ³] 'sibling' | 14. [t̡uʔwa ²] 'mouth' |
| 6. [k̡uta ³] 'you will give' | 15. [t̡uʔwa ³] 'forty' |
| 7. [t̡aʔa ²] 'fiesta' | |
| 8. [nguʃi ²] 'tomato' | |
| 9. [siyu ³] 'juice' | |

Is vocalic voicing phonemic in Chatino?

How about pitch?

Osage

North America: Siouan. 5 speakers

1. [dabrĩ]	'three'	6. [aḏikhã zã]	'he lay down'
2. [datspe]	'to eat'	7. [tsʔeḏe]	'he killed it'
3. [dakʔe]	'to dig'	8. [ḏeze]	'tongue'
4. [dalĩ]	'good'	9. [ḏie]	'you'
5. [daʃtu]	'to bite'	10. [ḏuza]	'to wash'

Do you think [d] and [ḏ] are separate phonemes?

Writing Rules

Capturing and formalizing the patterns

Capturing process

English nasalization

pæt	pæ̃n	æ occurs before t	æ̃ occurs before n
pat	pān		
dup	dūm	ɑ occurs before t	ɑ̃ occurs before n
dop	dōm		
sɪt	sĩm	u occurs before t	ũ occurs before m
		o occurs before t	õ occurs before m
		ɪ occurs before t	ĩ occurs before n

Generalizations?

Is there a process going on?

Does it make sense to talk about something happening in a particular environment?

English nasalization

pæt	pæ̃n	æ → æ̃ / __ Nasal Consonant
pat	pã̃n	ɑ → ã̃ / __ Nasal Consonant
dup	dũ̃m	u → ũ̃ / __ Nasal Consonant
dop	dõ̃m	o → õ̃ / __ Nasal Consonant
sɪt	sĩ̃n	ɪ → ï̃ / __ Nasal Consonant
...		

Do we need to do each vowel separately?

Do we need to specify 'consonant'?

Writing a more general rule $V \rightarrow \tilde{V} / ____ N$

phonetic and phonemic transcription

- Once we have the rule down, we don't really need to specify exactly how the vowel is pronounced every time we write it. Because our nasalization rule tells us that every time we see a vowel before a nasal coda, it's going to become its nasalized counterpart.
- So we can transcribe [e] and [ẽ], [æ] and [æ̃], and [o] and [õ] ... as /e/, /æ/ and /o/ respectively. And our nasalization rule will tell us that these vowels are nasalized before a nasal consonant.

Swahili

1. [ŋɔ̃ma] 'drum'
2. [bɔ̃ma] 'fort'
3. [ŋɔ̃mbe] 'cattle'
4. [bɔ̃mba] 'pipe'
5. [ɔ̃mba] 'pray'
6. [ɔ̃na] 'see'
7. [watoto] 'children'
8. [ndoto] 'dream'
9. [mboga] 'vegetable'
10. [ndogo] 'little'
11. [dzogo] 'rooster'
12. [ʃoka] 'axe'

What's the simplest rule?

Which allophone has the more restricted distribution?

/o/ --> [ɔ̃] / __N

Gascon

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

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

Voiced Stop --> Voiced Fricative /N__V

\$^{vd} --> F^{vd} /N__V

Can we say \$ --> F /N_V? What do we need to know?

Chatino

- | | |
|---------------------------------|--------------------------------|
| 1. [k̄aʔa³] 'you will bathe' | 10. [laʔa³] 'side' |
| 2. [k̄isu³] 'avocado' | 11. [nguta²] 'seed' |
| 3. [k̄us̄uʔwa³] 'you will send' | 12. [ndikĩ³] 'you are burning' |
| 4. [s̄eʔe²] 'place' | 13. [nguta²] 'seed' |
| 5. [t̄aʔa³] 'sibling' | 14. [t̄uʔwa²] 'mouth' |
| 6. [k̄uta³] 'you will give' | 15. [t̄uʔwa³] 'forty' |
| 7. [t̄aʔa²] 'fiesta' | |
| 8. [nguʃi²] 'tomato' | |
| 9. [siyu³] 'juice' | |

$V \rightarrow V_{\square} / C_{\square} _ C_{\square}$ or $V \rightarrow V^{vl} / C^{vl} _ C^{vl}$

Osage

- | | | | |
|-------------|-----------|----------------|----------------|
| 1. [dabrĩ] | 'three' | 6. [aḏikhã zã] | 'he lay down' |
| 2. [datspe] | 'to eat' | 7. [tsʔeḏe] | 'he killed it' |
| 3. [dakʔe] | 'to dig' | 8. [ḏeze] | 'tongue' |
| 4. [dalĩ] | 'good' | 9. [ḏie] | 'you' |
| 5. [daʃtu] | 'to bite' | 10. [ḏuza] | 'to wash' |

/ḏ/ --> [d] /__[a]

Zulu

1. ɓɔna	'see'	13. iboni	'grasshopper'
2. ɓɔpha	'bind'	14. umondli	'guardian'
3. mɔsa	'despoil'	15. umosi	'one who roasts'
4. umɔna	'jealousy'	16. inoni	'fat'
5. imɔɔ	'car'	17. udoli	'doll'
6. iqɔɔ	'small of back'	18. umxoxi	'story-teller'
7. ixɔɔ	'frog'	19. imomfu	'jersey cow'
8. isicɔɔ	'head ring'	20. lolu	'this'
9. isithɔmbe	'picture'	21. isitofu	'stove'
10. indɔdana	'son'	22. nomuthi	'and the tree'
11. umfɔkazi	'strange man'	23. udodile	'you acted like a man'
12. ibokisi	'box'		

Which variant has the more restricted distribution?

/ɔ/ --> [o] / __ CV^{high}

/ɔ/ --> [o] / __ CCV^{high}

/ɔ/ --> [o] / __ CCCV^{high}

/ɔ/ --> [o] / __ C(C)(C)V^{high} ...

/ɔ/ --> [o] / __ C₁V^{high}

So far, we've looked at allophonic variation

But phonetic processes can have other consequences.

Consider these data from Gascon

[kotʃ] 'neck'

[bebe] 'to drink'

[kutʃ] 'quiet'

[balo] 'ball'

[katʃ] 'fall' 3 sg.

[bilo] 'town'

[bibe] 'to live'

[hiw] 'string'

[how] 'crazy m.'

[ni] 'nest'

[nu] 'no fam.'

[ny] 'naked'

[bu] 'good m.'

[be] 'well'

[mylo] 'mule'

[malo] 'bad f.'

[py] 'little'

[pe] 'foot'

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 nyadze 'cloud'

u nuǒo 'knot'

e net 'night'

o

a nas 'nose'

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

Once upon a time, a change happened in this dialect 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 [o] occurring after a nasal is an /u/ or an /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'	breju	'picks grapes'
passo	'goes out'	bramu	'moos'
pago	'pays'	estunu	'surprises'
rodo	'wanders'		

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'	dzawn	dzawnu

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'	abajf+o
'drinks'	abewr+o
'swells up'	awhl+o

And we can apply a rule to those underlying forms:


$o \rightarrow u / N_$



'burns'	kram+o/	kramu	
'spoils'	abrim+o	abrimu	
'telephones'	telefun+o	telefunu	
'bathes'	bañ+o	bañu	
'descends'	abajf+o	NA	abajfo
'drinks'	abewr+o	NA	abewro
'swells up'	awhl+o	NA	awhlo

The same rule will work for the feminine marker:

$o \rightarrow u / N \underline{\quad}$



'full of drink'	hart+o	NA	harto
'false'	faws+o	NA	fawso
'cool'	fresk+o	NA	fresko
'big'	gran+o	granu	
'yellow'	dzawn+o	dzawnu	
'calm'	kalm+o	kalmu	