WRITING SOUNDS CHANGING

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Hawaiian: [t] → [k] & [ŋ] → [n]

		Hawaiian	
*tapu	→	kapu	'forbidden'
*taŋi	→	kani	'cry'
*taŋata	→	kanaka	'man'
*ŋutu	→	nuku	'mouth'
*tolu	→	kolu	'three'

Writing rules 4 unconditioned sound changes are simple:

Write the earlier form on the left & the later form on the right, with an arrow in between, showing the direction of change. So, our Hawaiian example can be expressed simply as:

[t] → [k]

[ŋ] → [n]

Writing Sound Change: Formal Rules

The Motu change involving the loss of the velar nasal can be expressed as:

ŋ → ø

* [ø] = no sound

Conditioned Sound Change

If a change takes place only in a specific phonetic environment, this environment is written following a single forward slash (/). Lower dash (_) indicates the location of the changed sound in relation to the conditioning environment:

t → s / ___ front V	[t] became [s] before front vowels (in Motu)
x → k / s ___	[x] became [k] after [s] (in Afrikaans)
p → v / V ___ V	[p] became [v] between vowels (in Banoni)

General format of phonological rules

A → B / C _ D

A = underlying representation [phoneme; natural class of phonemes; phonological feature(s), e.g., voiceless stops, etc.]

B = phonetic form – pronunciation (phone, specifically allophone of A; natural class of sounds; phonetic feature(s), e.g. aspirated

C and D = context/environment of the rule may be sounds, natural classes of sounds, phonological features or word boundary (#)

Possibilities: only C present; only D present; both C and D present

Notation/Symbols

→ = “became”/“becomes”

/ = “in the phonetic environment…”

__ = location of changed sound

V = any vowel

C = any consonant

* Phonemes are written between two forward slashes / /, and actual sounds (phones, allophones) – between two square brackets [_]: [r], [u:], [l], etc.

Notation/Symbols

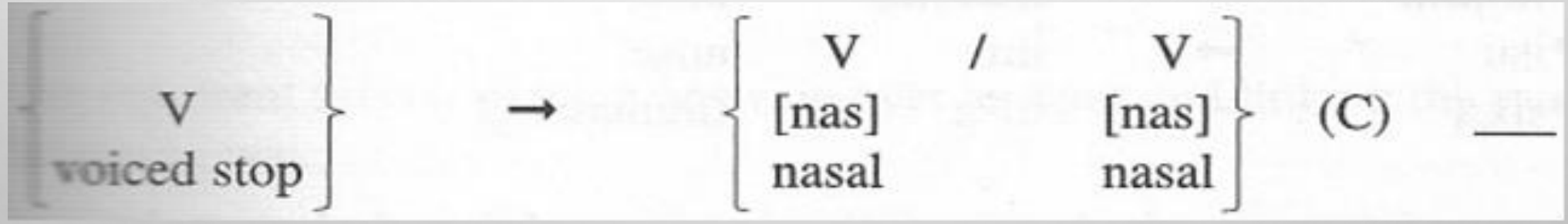
p	→	w / #__	=	Initial [p] became [w]
$_{\text{voiced}}$C	→	$_{\text{voiceless}}$C / __#	=	final voiced consonant becomes voiceless
V	→	ø / __ #=		word final vowels were deleted

Optional elements, which do not affect the application of the rule, are placed in round brackets:

V → $V_{[nas]}$ / $V_{[nas]}$ (C) __ = V were nasalized after nasal vowels with/without an intervening consonant

Notation/Symbols

When there are two different sets of sounds involved in a change, this can be represented by placing the sounds one above the other in curly brackets:



Notation/Symbols

Rules should always be stated in as general a way as possible, without being too general:

≠

t → s / __ { i, e }

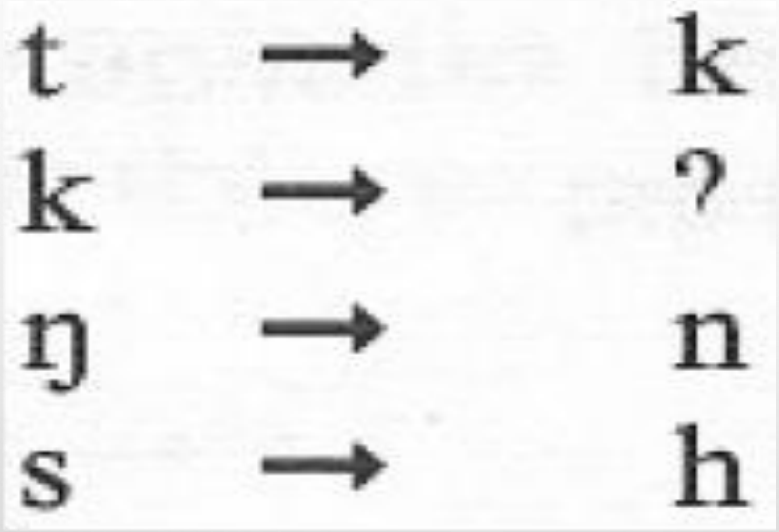
ORDERING OF CHANGES

When a language undergoes a whole series of sound changes, it is sometimes possible to reconstruct not only the changes themselves, but also the order in which the changes took place:

		Hawaiian	
*taŋi	→	kani	‘cry’
*kaso	→	ʔaho	‘thatch’
*takele	→	kaʔele	‘back of canoe’
*aka	→	aʔa	‘root’
*pito	→	piko	‘navel’
*paki	→	paʔi	‘slap’
*tapu	→	kapu	‘forbidden’
*taŋata	→	kanaka	‘man’
*isu	→	ihu	‘nose’
*sika	→	hiʔa	‘firemaking’

ORDERING OF CHANGES

The data above shows the following unconditioned changes:



In which order did these changes occur? Let us decide whether [t] shifted to [k] first, or whether [k] first shifted to [ʔ].

ORDERING OF CHANGES

If we assume that the [t] first shifted to [k], and that the other shift of [k] to [ʔ] took place after this, then changes like the following would have taken place:

*takele	→	kakele	'back of canoe'
*pito	→	piko	'navel'
*tapu	→	kapu	'forbidden'

If [k] then shifted to [ʔ], all words would with [k] sounds would also have changed as follows:

*kakele	→	ʔaʔele	'back of canoe'
*piko	→	piʔo	'navel'
*kapu	→	ʔapu	'forbidden'

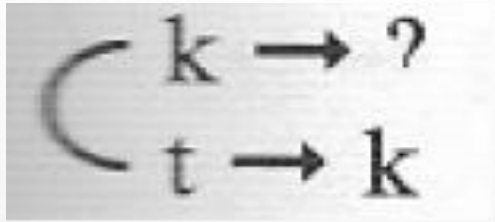
Sequencing Sound Changes

Hawaiian has no [ʔaʔele], [piʔo] & [ʔapu], but [kaʔele], [piko] & [kapu]. There must have been a distinction between [k] and [t] in Hawaiian when [k] shifted to [ʔ], otherwise all [k] and [t] sounds would have ended up as [ʔ]. Thus, the sequence of changes must have been:

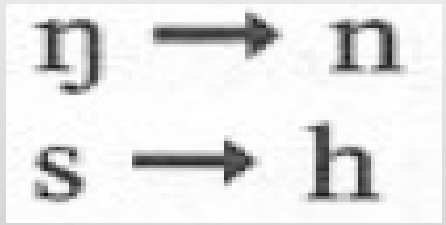
Protolanguage	Stage 1 k → ʔ	Stage 2 t → k	Modern Hawaiian	
*takele	taʔele	kaʔele	kaʔele	'back of canoe'
*aka	aʔa		aʔa	'root'
*pito		piko	piko	'navel'
*paki	paʔi		paʔi	'slap'
*tapu		kapu	kapu	'forbidden'

Sequencing Sound Changes

We can represent this sequence like this:



If there is no overlap between the sounds involved in the change (as [k] & [k] above), we cannot sequence them:



UNCONDITIONED SOUND CHANGES

Unconditioned sound changes are those that occur throughout the language, in all phonetic environments. Totally unconditioned sound changes are rare – there are always exceptions to every rule.

Example of unconditioned change - [ŋ] disappeared in modern Motu:

		Motu	
*asaŋ	→	lada	'gills of fish'
*taŋi	→	tai	'cry'
*laŋi	→	lai	'wind'
*taliŋa	→	taia	'ear'

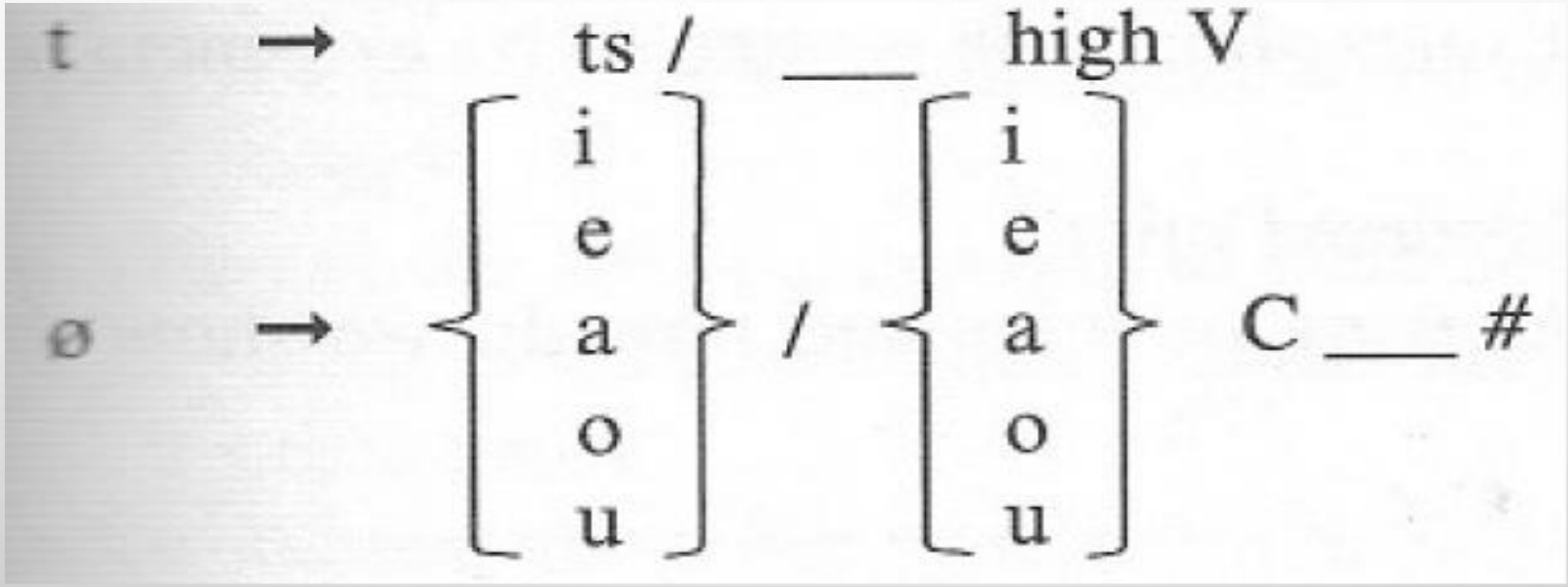
CONDITIONED SOUND CHANGES

Data from the Banoni language of the North Solomons Province of Papua New Guinea:

		Banoni	
*koti	→	kotsi	'cut'
*tina	→	tsina	'mother'
*puti	→	putsi	'pull out'
*mata	→	mata	'eye'
*mate	→	mate	'die'
*matua	→	matsua	'rise'
*makas	→	mayasa	'dry coconut'
*pakan	→	vayana	'add meat to staple'
*kulit	→	yuritsi	'skin sugarcane'

CONDITIONED SOUND CHANGES

Conditioned sound changes that took place here:



The first rule changes [t] to [ts] before the high vowels [i] or [u].

The second rule involves the addition of a harmonising vowel after a consonant at the end of a word.

CONDITIONED SOUND CHANGES

Since both these rules involve vowels, we can test them for ordering. If we assume that the change of [t] to [ts] took place first, the original Banoni word [*kulit] 'skin sugarcane' would not fit, because it has no vowel following [t] in the protolanguage.

If the vowel addition rule applied after [t] changed to [ts], we would get [Yuriti] and not the actual word [Yuritsi]. Therefore, the final harmonising vowel must already have been there, for [t] to change to [ts]:

Harmonising Vowel Addition

[t] → [ts]

Exercises

1. Express the following changes formally:
    - intervocalic [s] undergoes rhotacism while [s] before consonants is deleted
    - word initial consonants undergo weakening to [j]
    - intervocalic [h] changes to glottal stop
    - the second member of all consonant clusters is deleted
    - an epenthetic [ɔ] is added between the two members of a word final consonant cluster
    - word final high vowels are deleted while interconsonantal high vowels become schwa
    - a prothetic [h] is added before [e] and [ɔ]