

# Handout #10

Alternations with  $\emptyset$

# Kinyarwanda (Rwanda)

- ja:ndikaꞑ “he/she writes”
- iβitaβꞑ “a book”
- ja:ndik iβitaβꞑ “he/she writes a book”
- umu:nhuꞑ “a person”
- araguraꞑ “he/she buys”
- umuhoroꞑ “pruning knife”

# Kinyarwanda

- umu:nh aragur umuhoroᵒ  
“A person buys a pruning knife.”
- umu:nhu ja:ndika tʃja:nᵑ  
“The person writes a lot”
- kuvanaᵒ “to come together”
- icigáliᵒ “Kigali”
- kuvan icigáliᵒ “to come together from Kigali”

# Alternations

- In these forms, the morpheme alternations are the following:
  - ja:ndika̰ ~ ja:ndik ~ ja:ndika
  - umu:nhṵ ~ umu:nh ~ umu:nhu
  - aragura̰ ~ aragur
  - kuvana̰ ~ kuvan

# Alternations

- Voiced vowels (e.g. a, u) alternate with voiceless vowels (e.g. ḁ, u̥).
- **Distribution**
  - Voiceless vowels occur only at the end of an utterance.
  - Voiced vowels occur only elsewhere.
- **Phonemes:** /i, e, a, o, u/
- **Rule (Final devoicing):**
  - V --> [-voice] / \_\_\_\_ Utterance]

# Alternations

- Otherwise, the alternants differ in that one of the alternants has a final vowel, and the other doesn't.
- We say in this case that the vowel alternates with  $\emptyset$  (the empty string, i.e. nothing):
  - $a \sim \underset{\circ}{a} \sim \emptyset$ ,  $u \sim \underset{\circ}{u} \sim \emptyset$
- The alternation indicates that there is a restriction on distribution.

# Distribution

- The empty string  $\emptyset$  doesn't have a distribution, so we can't state the distribution of vowels relative to  $\emptyset$ .
- We just state the restriction on distribution in terms of which sequence doesn't occur.
- To determine what that restriction is, we look at the distribution of the alternants.
- The alternant with the final vowel occurs before pause, or before a consonant.

# Distribution

- The alternants without a final vowel occur before a word beginning with a vowel.
- Generalizing, what doesn't occur is a sequence of two vowels:
  - \*V V
  - The asterix indicates that the sequence is disallowed.

# Analysis: Underlying representations

- When two sounds are in neutralization distribution, the underlying representation of alternating morphemes has to have the sound with the restricted distribution.
- Nonalternating morphemes have underlying representations with the unrestricted sound.
- Only the restricted sound will be subject to change according to context.

# Analysis: Underlying representations

- The same logic extends to alternations with  $\emptyset$ .
- The restriction on distribution is on vowels - they can't occur before vowels.
- So alternating morphemes must have vowels in final position where they can come before vowels.
- The underlying representations of the alternating morphemes must thus be:
  - /ja:ndika, umu:nhu, aragura, kuvana/

# Analysis: Rule

- The rule must then take these underlying representations and turn them into the other ones (without final vowels) in the context where those occur.
- Rule (Vowel Deletion):
  - $V \rightarrow \emptyset / \_\_\_ V$
- This rule changes a vowel to  $\emptyset$ , i.e. it deletes it.

# Derivations

Underlying representations	/ja:ndika iβitaβo/	/ja:ndika/
Vowel deletion	/ja:ndik iβitaβo/	_____
Final devoicing	/ja:ndik iβitaβo̥/	/ja:ndikḁ/
Surface representations	[ja:ndik iβitaβo̥]	[ja:ndikḁ]

# Yawelmani (California)

(Kenstowicz and Kisseberth 1979: 77-99)

<u>“might Verb”</u>	<u>“having Verbed”</u>	<u>“will Verb”</u>	Present	<u>Verb gloss</u>
xatal	xatmi	xaten	xathin	“eat”
xilal	xilmi		xilhin	“tangle”
bok'al	bok'mi	bok'en	bok'hin	“find”
paʔtal	paʔitmi	paʔten	paʔithin	“fight”
	logiwmi	logwen	logiwhin	“pulverize”
ʔilkal			ʔilikhin	“sing”

# Yawelmani (California)

- The nonalternating morphemes here are the following:
  - xat “eat”
  - xil “tangle”
  - bok<sup>l</sup> “find”
  - -al “might”
  - -mi “having Verbed”
  - -en “will”
  - -hin “present”

# Yawelmani (California)

- The alternating morphemes are the following:
  - paʔit ~ paʔt            “fight”
  - ʔilik ~ ʔilk            “sing”
  - logiw ~ logw            “pulverize”
- The alternating sounds are i ~ ∅.

# Distribution of alternants

- All of the alternating stems have a final CC sequence in the alternants without [i].
- The nonalternating stems do not end in CC.
- The alternant with the [i] vowel occurs before a suffix beginning with C, e.g. *paʔit-mi*.
- The alternants without the [i] vowel occurs before a suffix beginning with a V, e.g. *paʔt-al*.

# Distribution of alternating sounds

- What we're looking for is a generalization about a sequence that does **not** occur.
- In this case, what doesn't occur is a sequence of three C's:
  - \*C C C.
- This is the distribution of the alternating sounds.
- If the alternant without [i] occurred before a C-initial suffix, CCC is what you'd expect to get:
  - \**paʔt -mi.*

# Analysis

- In this case what is ruled out is the sequence *without* the vowel.
- So that is the sequence that should occur in the underlying representations of the alternating morphemes:
  - / paʔt, ʔilk, logw /
- The process eliminates the forbidden sequence by inserting a vowel (**Epenthesis**):
  - $\emptyset \rightarrow$  V / C \_\_\_ C C  
[+high, -back]

# Derivations

Underlying representations	/paʔt - mi/	/paʔt - al/
Epenthesis	/paʔitmi/	_____
Surface representations	[paʔitmi]	[paʔtal]

# Yawelmani: More data

“might _____”	“having _____ed”	Present	Gloss
<b>dubal</b>	<b>dubmu</b>	<b>dubhun</b>	<i>lead by the hand</i>
<b>hudal</b>		<b>hudhun</b>	<i>recognize</i>
<b>ʔugnal</b>	<b>ʔugunmu</b>	<b>ʔugunhun</b>	<i>drink</i>
<b>luk<sup>l</sup>lal</b>		<b>luk<sup>l</sup>ulhun</b>	<i>bury</i>

# New alternations

- New alternations:
  - -mi ~ -mu “might \_\_\_\_”
  - -hin ~ -hun “Present”
  - ʔugn ~ ʔugun “drink”
  - luk<sup>l</sup> ~ luk<sup>ul</sup> “bury”
- Alternating sounds:
  - u ~ i
  - u ~ ∅

$i \sim u$

- When one set of sounds alternates with another, as in  $i \sim u$ , the two sets must be either in complementary or neutralization distribution.
- To discover the restriction on distribution, we look at the distribution of alternants.
  - *-mu* and *-hun* occur after stems whose last vowel is *u*.
  - *-mi* and *-hin* occur after all other stems.

i ~ u

- Distribution of the alternating sounds:
  - [i] does not occur after **u** C<sub>0</sub>, but does occur elsewhere.
  - [u] occurs after **u** C<sub>0</sub>, as well as elsewhere.
- Underlying representations of the alternating morphemes:
  - / -mi, -hin/
- Rule (Vowel harmony)
  - V --> [+back, -cor, +lab] / V C<sub>0</sub> \_\_\_\_\_  
[+high] [ +lab, +high]

**u ~ ø**

- The distribution of the **u ~ ø** alternants is exactly like that of the **i ~ o** alternants:
  - The alternants with the **u** occur before suffixes beginning with **C**.
  - The alternants without **u** end in **CC** and occur before suffixes beginning with **V**.
  - But the **u ~ ø** alternation occurs in the forms with the suffix alternants **-mu** or **-hun**.
  - The **i ~ ø** alternation occurs with the suffix alternants **-mi** or **-hin**.

# Analysis

- The simplest analysis is that the **i** that is introduced by epenthesis is subject to Vowel harmony, just like any other high vowel.
- To make this happen, we just have to insure that Epenthesis applies before Vowel harmony.
- Underlying representations of the alternating morphemes:
  - /ʔugn, luk<sup>1</sup>/

# Derivations

Underlying representation	/ʔugn - hin/	/paʔt - mi/
Epenthesis	/ʔugin - hin/	/paʔit - mi/
Vowel harmony	/ʔugun - hun/	_____
Surface representation	[ʔugunhun]	[paʔitmi]

# Rule ordering

- This analysis only works if Vowel Epenthesis applies before Vowel Harmony.
- Vowel Epenthesis creates opportunities for Vowel Harmony to apply.
- If Rule A creates opportunities for Rule B to apply (i.e. Rule B couldn't apply to the underlying representation but can apply to the output of Rule A), then Rule A is said to **feed** Rule B.
- Rule A must be applied before rule B.

# Reference

- Kenstowicz, Michael and Charles Kisseberth (1979). *Generative Phonology: Description and Theory*. Academic Press, San Diego.