Lecture #6

PHONOLOGICAL RULES

PHONOLOGICAL RULES: Formalized general statements about the distribution of non-contrastive properties of segments; they provide the phonetic information necessary for the pronunciation of utterances.

INPUT: Phonemic (dictionary) representation of words in a sentence.

OUTPUT: Phonetic representation of words in a sentence.

INPUT: UNPREDICTABLE

OUTPUT: PREDICTABLE

Unpredictable segments are **BASIC** or **UNDERLYING**.

Predictable forms: **DERIVED**

Phonological rules derive phonetic representations (PR) from underlying representations (UR).

FORMALIZATION:

Class of sound Change Conditioning environment: context

must be specified!

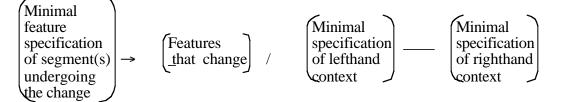
FOCUS (input) + CONTEXT (environment):

Structural Description (SD)

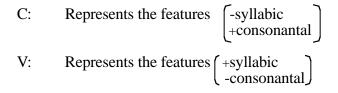
output: Structural Change (SC)

 $A \rightarrow B / x - y$

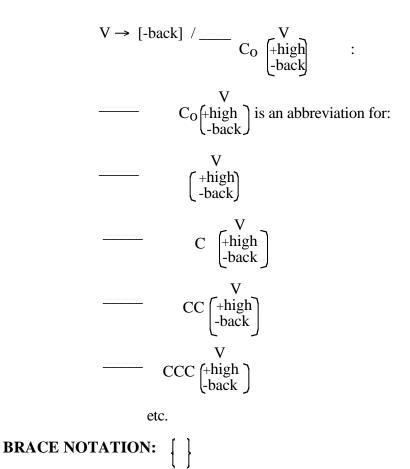
Read: <u>A</u> becomes <u>B</u> between \underline{x} and \underline{y}



NOTATIONS:



Zero subscript C_0 represents zero or more consonants



This notation combines two or more rules that have identical parts:

a. $V \rightarrow [+long] / - [+voice]$ b. $V \rightarrow [+long] / - #$ Combined rule: $V \rightarrow [+long] / - \{ \begin{array}{c} C \\ [+voice] \\ \# \end{array} \}$

#	word boundary
or $\boldsymbol{\sigma}$ (or \$)	syllable boundary
+ or a dash e.g., [p ^h ẽn-z]	morpheme boundary

PARENTHESIS NOTATION: ()

Parentheses are used as a formal device for collapsing two similar rules when one contains a specification lacking in the other.

a. $\begin{pmatrix} -\text{ continuant} \\ -\text{ voice} \end{pmatrix} \rightarrow [+SG] / \sigma - [+stress]$

b.
$$\begin{pmatrix} -\text{ continuant} \\ -\text{ voice} \end{pmatrix} \rightarrow [+SG] / \sigma \longrightarrow \begin{pmatrix} +\text{consonantal} \\ -\text{sonorant} \\ -\text{nasal} \end{pmatrix} \begin{bmatrix} V \\ [+\text{stress}] \end{bmatrix}$$

Combined rule:

$$\begin{pmatrix} -\text{ continuant} \\ -\text{ voice} \end{pmatrix} \rightarrow [+SG] / \sigma \longrightarrow \left(\begin{pmatrix} +\text{consonantal} \\ -\text{sonorant} \\ -\text{nasal} \end{pmatrix} \right) V \\ [+\text{stress}]$$

Where *braces* are used, each rule to be collapsed contains restrictions not found in the other. With *parentheses*, only one of the rules has an additional restriction.

These notations are employed only for collapsing rules involving the same processes, and *not*_any two rules.

Ø: left of the arrow -- insertion

right of the arrow -- deletion

$$\emptyset \rightarrow \upsilon / V _ 1$$

 $C \rightarrow \emptyset / ---- \#C$

ALPHA NOTATION: α

If two rules are identical except for the values of the same feature, then the two rules can be replaced by a single rule. The values which are different in the two rules are replaced by a variable -- the Greek letter *alpha* -- in the new rule.

e.g. Nasalization in Malay:

mẽwĩah	luxurious
mãỹãk	stalk
mãrah	ascend
nãẽ?	scold
mə̃laraŋ	forbid
mãkan	eat
rumãh	house
kərəta	car

 $[-consonantal] \rightarrow [\alpha nasal] / [\alpha nasal] -----$

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RULES WITH MULTIPLE VARIABLES: α , β

Turkish (Poss. Suffix)

-im, -üm, im, -um -- Vowel Harmony

 $\begin{array}{ccc} V & V \\ V & \rightarrow \left(\begin{matrix} \alpha \ back \\ \beta \ round \end{matrix} \right) & / \left(\begin{matrix} \alpha back \\ \beta \ round \end{matrix} \right) Co \ + \ Co \ ----- \end{array}$

ANGLED BRACKET NOTATION: < >

Used with rules that involve dependencies between two feature specifications by way of adding a condition to the rule of the form

"if *a*, then *b* "

ENGLISH:

critical	[k]	criticism	[s]
opaque	[k]	opacity	[s]
analogue	[g]	analogize	[dʒ]
regal	[g]	regicide	[dʒ]

Velar Softening Rule:

[+ VS] Suffixes that condition the change of velars as in this rule.

If [- voice], then $\left(\begin{array}{c} + \text{ anterior} \\ + \text{ continuant} \end{array}\right)$

 $\frac{\text{in addition to}}{+ \text{ strident}} \qquad \left(\begin{array}{c} \text{CORONAL} \\ + \text{ strident} \end{array} \right)$

FORMALIZATION OF RULES FOR METATHESIS AND COALESCENCE:

TRANSFORMATIONAL RULES

a. <u>Metathesis</u>

Hanunoo:

[?] usa	one	kas?a	once
[?] upat	four	kap [?] at	four times
[?] unum	six	kan ⁹ um	six times
tulu	three	katlu	three times

The cluster glottal stop and consonant becomes consonant and glottal stop between vowels.

V
$$\begin{pmatrix} -\text{continuant} \\ +\text{CG} \end{pmatrix}$$
 C V \rightarrow 1 3 2 4

1 2 3 4

b. <u>Coalescence</u>

French:

 $\begin{array}{cccc} [pl \epsilon \underline{n} \ominus] & full (Fem.) & [pl \tilde{\epsilon}] & (masc.) \\ [tonalite] & tonality & [t \tilde{\delta}] & tone \\ & C & 1 \\ V & [+nasal] & \# \rightarrow & [+nasal] & \emptyset & 3 \\ 1 & 2 & 3 \end{array}$

A vowel plus a nasal consonant becomes a nasalized vowel when the consonant is word-final.

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