LINGUISTICS 221 **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)

$$A \rightarrow B \ / \ x \text{ — } y$$

Read: A becomes B between x and y

(Minimal feature specification of segment(s) undergoing the change) → (Features that change) / (Minimal specification of lefthand context) ____ (Minimal specification of righthand context)

NOTATIONS:

C: Represents the features $\begin{bmatrix} \text{-syllabic} \\ \text{+consonantal} \end{bmatrix}$

V: Represents the features $\begin{bmatrix} \text{+syllabic} \\ \text{-consonantal} \end{bmatrix}$

Zero subscript $\mathbf{C_o}$ represents zero or more consonants

$$V \rightarrow [\text{-back}] \; / \; \underline{\quad} \; C_o \begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix} :$$

$$\underline{\quad} \; C_o \begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix} \text{ is an abbreviation for:}$$

$$\underline{\quad} \; \begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix}$$

$$\underline{\quad} \; C \begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix}$$

$$\underline{\quad} \; CC \begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix}$$

$$\underline{\quad} \; CCC \begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix}$$

etc.

BRACE NOTATION: $\{ \; \}$

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

a. $V \rightarrow [\text{+long}] \; / \; \underline{\quad} \; \begin{matrix} C \\ [\text{+voice}] \end{matrix}$

b. $V \rightarrow [\text{+long}] \; / \; \underline{\quad} \; \#$

Combined rule:

$$V \rightarrow [\text{+long}] \; / \; \underline{\quad} \left\{ \begin{matrix} C \\ [\text{+voice}] \\ \# \end{matrix} \right\}$$

#	word boundary
or σ (or $)	syllable boundary
+ or a dash e.g., [pʰɛ̃n-z̥]	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. $\begin{bmatrix}\text{- continuant}\\ \text{- voice}\end{bmatrix} \rightarrow [+SG] \;/\; \sigma \text{ ——} \overset{V}{[+stress]}$

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

Combined rule:

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

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

Ø → ʊ / V __ l

C → Ø / ——— #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:

mẽwãh	*luxurious*
mãỹãk	*stalk*
mãrah	*ascend*
nãẽʔ	*scold*
mələraŋ	*forbid*
mãkan	*eat*
rumãh	*house*
kərəta	*car*

[-consonantal] → [α nasal] / [α nasal] ———

RULES WITH MULTIPLE VARIABLES: α, β

Turkish (Poss. Suffix)

-im, -üm, ɨm, -um -- Vowel Harmony

$$\begin{matrix} V \\ [+\text{high}] \end{matrix} \rightarrow \begin{bmatrix} V \\ \alpha \text{ back} \\ \beta \text{ round} \end{bmatrix} \quad / \quad \begin{bmatrix} V \\ \alpha\text{back} \\ \beta \text{ round} \end{bmatrix} \text{Co} + \text{Co} \text{ ———}$$

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	[ʤ]
regal	[g]	regicide	[ʤ]

Velar Softening Rule:

$$\begin{bmatrix}\text{-anterior}\\ \text{-continuant}\\ \langle\text{-voice}\rangle\end{bmatrix} \rightarrow \begin{pmatrix}\text{CORONAL}\\ \text{+ strident}\\ \langle\text{+ anterior}\\ \text{+ continuant}\rangle\end{pmatrix} / \underline{\quad} \; [+\text{VS}]$$

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

If [- voice], then $\begin{bmatrix}\text{+ anterior}\\ \text{+ continuant}\end{bmatrix}$

<u>in addition to</u> $\begin{bmatrix}\text{CORONAL}\\ \text{+ strident}\end{bmatrix}$

FORMALIZATION OF RULES FOR METATHESIS AND COALESCENCE:

TRANSFORMATIONAL RULES

a. <u>Metathesis</u>

Hanunoo:

ʔusa	*one*	kasʔa	*once*
ʔupat	*four*	kapʔat	*four times*
ʔunum	*six*	kanʔum	*six times*
tulu	*three*	katlu	*three times*

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

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

1 2 3 4

b. Coalescence

French:

[plɛn̠ə]	*full* (Fem.)	[plɛ̃]	(masc.)
[tɔnalite]	*tonality*	[tɔ̃]	*tone*

$$\begin{array}{cccccc} & C & & & 1 & \\ V & [+\text{ nasal }] & \# & \rightarrow & [+\text{nasal}] & \emptyset \quad 3 \\ 1 & 2 & 3 & & & \end{array}$$

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