PHONOLOGICAL RULES (A Review)

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)
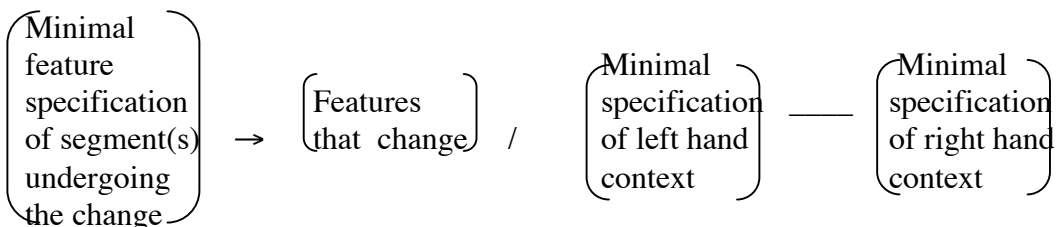> from underlying representations (UR).

FORMALIZATION:

Class of sound
Change   } must be specified!
Conditioning environment: context

FOCUS (input) + CONTEXT (environment): **Structural Description** (SD)

output: **Structural Change** (SC)

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

Read: <u>A</u> becomes <u>B</u> between <u>x</u> and <u>y</u>

$$
\begin{pmatrix} \text{Minimal} \\ \text{feature} \\ \text{specification} \\ \text{of segment(s)} \\ \text{undergoing} \\ \text{the change} \end{pmatrix} \rightarrow \begin{bmatrix} \text{Features} \\ \text{that change} \end{bmatrix} \ / \ \begin{pmatrix} \text{Minimal} \\ \text{specification} \\ \text{of left hand} \\ \text{context} \end{pmatrix} \underline{\quad\quad} \begin{pmatrix} \text{Minimal} \\ \text{specification} \\ \text{of right hand} \\ \text{context} \end{pmatrix}
$$

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 C_0 represents   zero or more consonants

$$V \rightarrow [\text{-back}] \; / \; \underline{\hspace{1cm}} \; C_0 \begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix} \quad :$$

$\underline{\hspace{1.5cm}}$ $C_0 \begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix}$ is an abbreviation for:

$\underline{\hspace{1.5cm}}$ $\begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix}$

$\underline{\hspace{1.5cm}}$ $C \begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix}$

$\underline{\hspace{1.5cm}}$ $CC \begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix}$

$\underline{\hspace{1.5cm}}$ $CCC \begin{bmatrix} V \\ \text{+high} \\ \text{-back} \end{bmatrix}$

etc.

BRACE NOTATION: $\{\;\}$

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

a. $V \rightarrow [+long] / \underline{} \overset{C}{[+voice]}$

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

Combined rule:

$$V \rightarrow [+long] / \underline{} \left\{ \begin{array}{c} C \\ [+voice] \\ \# \end{array} \right\}$$

#	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. $\begin{bmatrix} -\text{continuant} \\ -\text{voice} \end{bmatrix} \rightarrow [+SG] / \sigma \underline{} \overset{V}{[+\text{stress}]}$

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

Combined rule:

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

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

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:

mẽw̃ãh	*luxurious*
mãỹãk	*stalk*
mãrah	*ascend*
nãẽʔ	*scold*
mãlaraŋ	*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

$$V_{[+high]} \rightarrow \begin{bmatrix} V \\ \alpha \text{ back} \\ \beta \text{ round} \end{bmatrix} / \begin{bmatrix} V \\ \alpha \text{back} \\ \beta \text{ round} \end{bmatrix} C_0 + C_0 \underline{\hspace{1cm}}$$

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:

$$\begin{bmatrix} \text{-anterior} \\ \text{-continuant} \\ \text{<-voice>} \end{bmatrix} \rightarrow \begin{bmatrix} \text{CORONAL} \\ \text{+ strident} \\ \text{<+ anterior} \\ \text{+ continuant>} \end{bmatrix} / \text{——— [+VS]}$$

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

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

in addition to $\begin{bmatrix} \text{CORONAL} \\ \text{+ strident} \end{bmatrix}$

FORMALIZATION OF RULES FOR METATHESIS AND COALESCENCE:

TRANSFORMATIONAL RULES

a. Metathesis

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.

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

$$1 \qquad 2 \qquad\qquad 3\ 4$$

b.   Coalescence

French:

[plɛn̪ə]   *full* (Fem.)   [plɛ̃]   (masc.)

[tɔnalite]   *tonality*   [tɔ̃]   *tone*

$$V \quad \begin{matrix} C \\ [+\text{nasal}] \end{matrix} \ \# \quad \rightarrow \quad [+\text{nasal}] \quad \begin{matrix} 1 \\ \varnothing \end{matrix} \quad 3$$

$$1 \qquad 2 \qquad 3$$

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