

## Phonological Rule statement notations

Phonological rules state how phonemes in a language are actually pronounced in different environments within a word

## Phonological rule notation

- Abstractly, we can represent this in the following notation:  $X \rightarrow Y / \_\_\_ Z$
- **Basic definitions:**
  - - the ' $\rightarrow$ ' means 'changes to';
  - - the slash '/' means 'in the environment of'; and
  - - the ' $\_\_\_$ ' positions the input in relation to other elements in the phonological environment (e.g., before or after).
- What this rule simply says is "An input X changes to Y when it occurs before Z."

## $X \rightarrow Y / Z \_\_\_$ Phonological rule statement notation

- Suppose instead that we want to say that X changes to Y *after* (rather than *before*) Z.
- How do we do that in rule notation?
- Well, a simple change will get us the required result:
- $X \rightarrow Y / Z \_\_\_$

## Phonological rule notation

- By convention, we will use "." to indicate a syllable boundary, and "#" to indicate a word boundary.
- Now, read the following abstract rules.
- $X \rightarrow Y / . \_\_\_$
- $X \rightarrow Y / \_\_\_ .$
- $X \rightarrow Y / \_\_\_ \#$
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### • PARENTHESIS NOTATION: ( )

- Parentheses are used as a formal device for indicating optional elements in the environment of a rule. For instance, the following two rules for the same process may be combined

- a.  $\left[ \begin{array}{l} - \text{continuant} \\ - \text{voice} \end{array} \right] \rightarrow [+SG] / . \_\_\_ \left[ \begin{array}{l} V \\ [+stress] \end{array} \right]$
- b.  $\left[ \begin{array}{l} - \text{continuant} \\ - \text{voice} \end{array} \right] \rightarrow [+SG] / . \_\_\_ \left[ \begin{array}{l} +\text{sonorant} \\ -\text{syllabic} \\ -\text{nasal} \end{array} \right] \left[ \begin{array}{l} V \\ [+stress] \end{array} \right]$

- SG in the output of the above rules stand for Spread Glottis feature (aspiration)
- The second rule above accounts for aspiration of initial voiceless stops in words like plum, pram, clean, crumb etc.
- The second rule above differs from the first only with respect to the additional presence of a consonant in the environment for the rule. Hence we may combine both the above rules in a single rule by putting the additional consonant element in a parenthesis.

- Combined rule:

- $\left. \begin{array}{l} - \text{continuant} \\ - \text{voice} \end{array} \right\} \rightarrow [+SG] / \_ \left. \begin{array}{l} +\text{sonorant} \\ -\text{syllabic} \\ -\text{nasal} \end{array} \right\} \text{V} [+stress]$

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- 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.

- **BRACE NOTATION: {**

- Brace notation is employed when the same rule applies to more than one environment. The notation entails that the environment given stand in an 'either or' relation.

- For instance look at the following rules. Vowels are lengthened before a voiced obstruent and also word finally

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- a.  $V \rightarrow [+long] / \_ \left[ \begin{array}{l} C \\ -\text{sonorant} \\ +\text{voice} \end{array} \right]$
- b.  $V \rightarrow [+long] / \_ \#$

- Combining rules a. and b., using braces we can have it as :

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- $V \rightarrow [+long] / \_ \left[ \begin{array}{l} C \\ -\text{sonorant} \\ +\text{voice} \\ \# \end{array} \right]$
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## Exercise

- In American English /r/ is dropped in two environments.
- Word finally as in car, war, mar, bar etc.
- Before a word final consonant as in park, work, mart, surf, nerd, etc.
- Deletion is expressed as  $\emptyset$ . **So write an r deletion rule using parenthesis and brace convention**