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 ‘→’ 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.”

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:
  - \(X \rightarrow Y / Z ___\)

By convention, we will use ." to indicate a syllable boundary, and "#" to indicate a word boundary.

Now, read the following abstract rules.

- \(X \rightarrow Y / . ___\)
- \(X \rightarrow Y / ___ .\)
- \(X \rightarrow Y / ___ #\)

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. continuous
  - voice
  \(\rightarrow [+SG] / .____ [+stress]\)
- b. continuous
  - voice

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 be combine both the above rules in a single rule by putting the additional consonant element in a parenthesis.
• Combined rule:
  - continuant 
  - voice → [+SG]/ _ +sonorant +syllabic
  - nasal [+stress] V

• 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
  a. V → [+long] / _ +sonorant +voice
  b. V → [+long] / _

  Combining rules a. and b. using braces we can have it as :
  •
  •
  V → [+long] / _ +sonorant +voice
  #

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 Ø. So write an r deletion rule using parenthesis and brace convention