

Phonological Rules in Phonological Representation: An Elaboration with Some Identified Rule Notation

Manas Jyoti Bora, PhD
Research Scholar
IIT Guwahati, Assam
manas_jyoti@iitg.ac.in

Krishna Hazarika, PhD Research Scholar
Jawaharlal Nehru University, New Delhi
Krishnaahazarika47@gmail.com

Abstract

This article discusses phonological rules, which are an integral component of sound level analysis and sound configuration. The major goal of this article is to emphasize the importance of phonological rules in phonological representation and to identify the basic phonological rules involved in this process. With it, we shall explain what phonological rules are and how the change from phonology to morphology allows for interconnected adaptation in this article. Then we'll try to represent all of the relevant technical terminology for a phonological research study.

1.0 Introduction

Phonological rules are formal expressions that describe changes in the phonological representations and phonological rule notation of words. As a result of the application of a phonological rule, a segment may be inserted or deleted, or one or more of its feature values may be changed. Here, we have discussed the formal notation and representation for writing the phonological rules which were introduced by Chomsky and Halle in *Sound Pattern of English* (1968).

2.0 Phonological Rules

The phonological rules are language specific. The existence of difference processes and the representative rules in different languages is what makes each language unique. Phonological rules indicate the representation or notation of phonological processes. It denotes the individual sense of sounds in particular phonological context.

Phonological rules are formal representation of phonological processes. Phonological rules have three parts:

- a) The kind of sound that gets change,

- b) How it gets changed,
- c) The context where the change occurs.

The general format of an SPE rule is as given below:

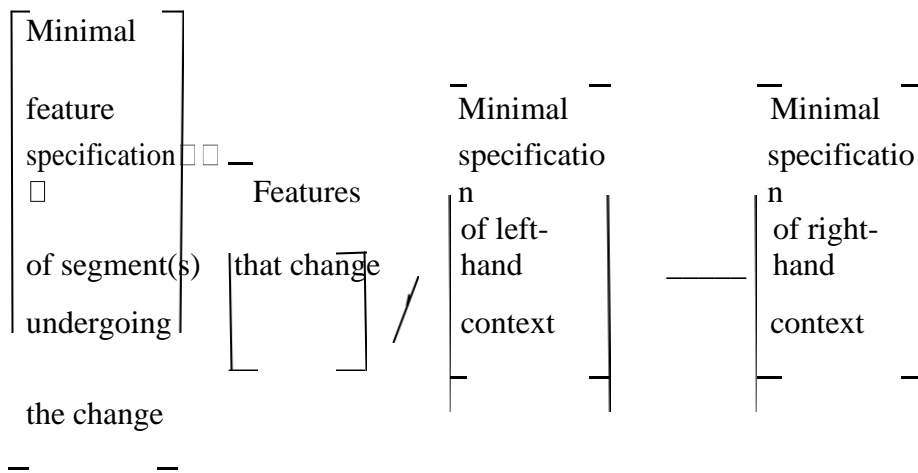


Fig. 1: SPE rule formalism

2.1 General Phonological Rules

These are the rules that apply throughout the language – to any sequence of sounds that meet the conditions for the rule. These rules are blind to morphology, syntax or any other level of grammar, i.e. they do not pay attention to the morphological composition of the word, or its syntactic category. E.g., vowel harmony for the height ([+high]) feature in Assamese is applicable to all the words which contain the high vowel [i] & [u]. It may be within or across morpheme; hence vowel harmony is applied throughout the language.

2.2 Morpho-phonological Rules

These rules are sensitive to the morphological composition of a word – they apply at the junction of two morphemes, or to a restricted set of morphemes. E.g., the rule for nasal place assimilation in English applies only while prefixing /in-/, but not /-un/, and the segments involved in the rule are the consonants at the end of /-in/ and the consonant at the beginning of the stem to which it is attached. There are other rules that apply to only verbs, only nouns etc.

3.0 Notation

The phonological rules mentioned above (Fig. 1) are usually written in the following forms:

$$A \rightarrow B/C_D$$

This formalism is called rule notation.

According to this format,

- (i) **The feature specification to the left of the arrow ‘A’ is the class of sounds to be changed.** It is called *target* or *focus* or Structural Description (SD).
- (ii) **The feature specification to the right of the arrow ‘B’ tells what has changed in the target.** It is called the *change* or Structural Change.
- (iii) The items to the right of the slash are the *environment*, (C__D), i.e., the context where the change occurs. The sounds that form the environment are also referred

to as the *trigger*, because it is in the environment of these sounds that the rules get applied.

- (iv) **The blank ‘___’ is called the *focus bar*.** It represents the location of the target in the environment.

For example: (a) in the regressive assimilation,

octo>otto

kt>tt

Applying this rule in notation –

A □ B/C__D

k□□ t/__t

(b) in the progressive

assimilation, kolnis>kollis

ln>ll

Applying this rule in notation –

A □ B/C__D

n□□ l/l__

The following conditions are satisfied for the phonological rules:

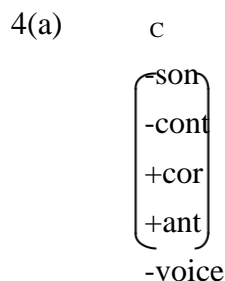
- (i) A, B, C, and D are distinctive feature matrices except that;
- A or B (but not both) may be null (∅),
 - C or D (or both) may be absent,
 - A may consist of only one feature column.
- (ii) **C or D may contain the boundary symbols, ‘#’ (word-boundary) or ‘+’ (morpheme-boundary).**

3.1 Some symbols used for notations are listed as below

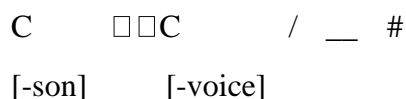
- Co - intervening consonants do not affect the phonological process. (it happens in vowel harmony).
- # - word boundary.
- || - phrase boundary/pause.
- + - morpheme boundary.
- Ø - can be used for insertion or deletion.
- α, , – express the feature-coefficient variable, which represent the two feature values {-,+}.
- '>' indicates historical or diachronic phonological change.
- '□' indicates synchronic phonological change.

4.0 Representations

In the representation of phonological rules proposed by SPE, segments are lists of feature specification. These are also referred to as a feature matrix. E.g. the segment [t] has the following feature matrix: [-son], [+cor], [+ant], [-voice]. This would be represented as following:



4(b) The rule FINAL DEVOICING in Dutch that devoices obstruent in word-final position can be represented as:



4 (c) In Phonology, for formal representation of rules:

- Segments expressed in distinctive features to the left of the arrow are the underlying representation.
- The arrow expresses the direction of the change.
- The segments expressed in features to the right of the arrow are the change or the surface realization.
- Slash separates the environment from the rest of the rule.
- The dash after or before the conditioning factor expresses the point or position in which the change took place.
- The feature specifications before or after the dash line indicates the conditioning environment.

4.1 Rule Notation and Representation for Different Positions

4.1.1 Reference to the Syllable

The Dutch FINAL DEVOICING also applies to obstruents in the coda position of a syllable. This is shown in {4(d)} below, where the σ -labeled parenthesis is used to indicate the syllable boundary.

4(d) [-son] □ □ [-voice] / __ C₀) σ { only the feature matrix will be used }

4.1.2 The Brace

The *brace* notation is used to express a disjunction between two or more terms, and thus found in rules that are partly identical. Rule 4(e), for instance, nasalizes vowels before a nasal followed by another consonant or word-finally.

4(e) V □ □ [+nasal] / __ [+nasal] { C #

4.1.3 Variable Feature Values

Feature values are made agree to express assimilation. For example, in Turkish, high vowels in suffixes agree for [back] and [round] with the preceding vowel. Rule 4(f) says that high

vowels agree in backness and roundness with the preceding vowel: **α could be** – or +

4(f)

$$\left(\begin{array}{c} +\text{syll} \\ +\text{high} \\ \text{h} \end{array} \right) \square \left(\begin{array}{c} \alpha \text{ back} \\ \text{round} \end{array} \right) / \left(\begin{array}{c} \alpha \text{ back} \\ \text{round} \end{array} \right) \begin{array}{c} \text{C} \\ 0 \end{array} \text{ —}$$

4.1.4 Parentheses

The *parentheses notation* is used to include optional elements in rules. Dutch has a rule of REGRESSIVE VOICING which applies within words as well as across word boundary. The rule 4(g) shows that the #s need to put in parentheses to indicate that they may, but need not, be present in the representation.

$$4(g) \text{ [-son]} \square \square \text{ [+voice]} / (\#\#) \left(\begin{array}{c} +\text{voice} \\ -\text{cont} \\ -\text{son} \end{array} \right)$$

4.1.5 The Transformational Rule Format

There are processes that affect more than one segment. For example, METATHESES is a process that switches round two segments, as can be seen in the Old English word for *grass*, which varied between [graes] and [gaers]. To able to refer to changes involving more than **one segment, the transformational rule format is used. Rule 4(h) says: ‘Delete a coronal nasal before a consonant or word-finally and nasalize the vowel that precedes it’**. It would **change** French [bɔn] and [bɔnte] into [bɔ̃] and [bɔ̃te], respectively.

$$4(h) \left(\begin{array}{c} [+syll] \\ +\text{cons} \\ +\text{nasal} \\ +\text{cor} \end{array} \right) \square \text{ [+nasal]} \emptyset \text{ —} \left\{ \begin{array}{c} \text{C} \\ \# \end{array} \right.$$

5.0 Conclusion

In conclusion, it can be said that phonological rule notation is essential for the representation of phonological rules. Through the representation of phonological rules in notation, it is easy to express different phonological processes of a language. Some examples are given below:

5(a) In Polish, a back non-high vowel becomes high in the environment before a voiced sound in word final position:

$$\left(\begin{array}{l} +\text{syll} \\ +\text{back} \\ -\text{high} \end{array} \right) \rightarrow [+high] / _ [+voice] \#$$

5(b) In English, a nasal consonant takes on the place specification (same values for [labial], [coronal] and [dorsal]) as a following stop:

$$\left(\begin{array}{l} -\text{cont} \\ +\text{nasal} \end{array} \right) \rightarrow \left(\begin{array}{l} \alpha \text{ labial} \\ \beta \text{ coronal} \end{array} \right) / _ \left(\begin{array}{l} -\text{cont} \\ -\text{son} \\ \alpha \text{ labial} \\ \beta \text{ coronal} \end{array} \right)$$

Thus, /-in/ becomes /-im/ in **“impossible”**.

5(c) In Assamese, a high vowel gets deleted following a non-high vowel:

$$\left(\begin{array}{l} +\text{syll} \\ +\text{high} \end{array} \right) \rightarrow \emptyset / \left(\begin{array}{l} +\text{syll} \\ -\text{high} \end{array} \right)$$

Thus, k^hailu → k^halu “ate”.

5(d) In British English, “Preglottalization” glottalizes voiceless plosives in the coda position:

$$\left(\begin{array}{l} -\text{son} \\ -\text{cont} \\ -\text{voice} \end{array} \right) \rightarrow \left(\begin{array}{l} -\text{son} \\ -\text{cont} \\ -\text{voice} \end{array} \right) / _) \sigma$$

[+cons
gl]

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