

ENGLISH PHONOLOGICAL PROCESSES A STUDY OF GENERATIVE PHONOLOGY THEORY

J Sutomo
Universitas Stikubank Semarang

Abstract

English phonological processes happen both in word and phrase levels. In the word level, it occurs when a morpheme is combined with another morpheme. One of the sound will experience a change because of the influence of the other morpheme. The English phonological process also occurs in a phrase level. This change is caused by the influence of syntactic factors. This study aims at explaining the forms of phonological processes of English language that occur in word level, concerning the processes of assimilation and some other morpho-phonemic changes. In explaining the phonological processes, the writer uses the Generative Phonology Theory which is firstly introduced by Noam Chomsky in 1957. The Generative School of Phonology was founded by Noam Chomsky in the late 1950s. Its basic premises are that phonological structure reflects the linguistic competence of the individual native speaker to compute a phonetic representation for the potentially infinite number of sentences generated by the syntactic component of the grammar.

Key words: *phonological processes, assimilation, morpho-phonemic changes, generative phonology, linguistic competence.*

INTRODUCTION

One of the aspects of language is speech sound. The study of speech sound in language is called phonology. Each language has its own speech sound structure which differ from one language to another language. By learning the speech sound structure of language, not only can we recognize and understand how to pronounce a word of a language correctly, but can also produce the word using correct pronunciation. Furthermore, we will be able to explain why we should pronounce it that way.

In his book 'English Phonetics,' Ramelan (1994:2) says when a student wants to learn a foreign language, in this case, English, he will have to learn to speak it. He has to try to speak in the way the native speakers speak the language. This can be achieve by closely imitating and mimicking them untirelessly until his pronunciation is satisfactory and acceptable to them. Ramelan (1994:3) also said that above all, the student has to be able to discriminate the contastive sound units that distinguish one utterance from another, both on the production level and on the recognition level.

As it is mentioned before, the study of speech sound structure of language is called phonology. Phonology is a branch science of linguistics, the study of language in

general. Odden (2005: 2) states that phonology is one of the core fields that composes the discipline of linguistics, which is defined as the scientific study of language structure.

The speech sounds of language that we study in phonology are symbolic sounds that represent the physical sounds of language. Odden (2005:2) says that the point which is most important to appreciate at this moment is that the “sounds” which phonology is concerned with are symbolic sounds – they are cognitive abstractions, which represent but are not the same as physical sounds.

What is the difference between phonetics and phonology? Phonetics is the study of speech sounds which concerns with the actual physical sounds as it is spoken by human speech organs, while phonology concerns with rules of speech sound structure of language. Odden (2005:2) says that a common characterization of the difference between phonetics and phonology is that phonetics deals with “actual” physical sounds as they are manifested in human speech, and concentrates on acoustic waveforms, formant values, measurements of duration measured in milliseconds, of amplitude and frequency, or in the physical principles underlying the production of sounds, which involves the study of resonances and the study of the muscles and other articulatory structures used to produce physical sounds. On the other hand, phonology, it is said, is an abstract cognitive system dealing with rules in a mental grammar: principles of subconscious “thought” as they relate to language sound.

Studying phonology concerns with phonetics, the study of speech sounds as actual physical sounds, and phonemics, the study of speech sounds as signaling units. Ramelan (1994:1) states that the study of speech sounds may be carried out from different viewpoints. When we study speech sounds as sounds, without regard to their function as signaling units of language, the science is called “phonetic.” When we study speech sound with a view to finding out the significant units of sounds in a given language, the science is called “phonemic.”

Talking about phonetics and phonemics, it concerns with the rules of combining speech sounds of language. There are rules of combining speech sounds of language, and some rules which are applicable to certain language might not be applicable to another language. Odden (2005:3) convinces that another aspect of language sound which a phonological analysis would take account of is that in any given language, certain combinations of sounds are allowed, but other combinations are systematically impossible.

Phonological rules are the rules of combining speech sound structure of certain language, these rules can be created by conducting a phonological process in the aspects of the language being studied. English phonological processes happen both in word and phrase levels. In the word level, it occurs when a morpheme is combined with another morpheme. One of the sound will experience a change because of the influence of the other morpheme. The English phonological process also occurs in a phrase level. This change is caused by the influence of syntactic factors.

The purpose of this article is explaining the forms of phonological processes of English language that occur in word level, concerning the processes of assimilation and some other morpho-phonemic changes. In explaining the phonological processes, the writer uses the Generative Phonology Theory which is firstly introduced by Noam Chomsky in 1957. As its name suggests, this theory explains a lot of syntactic concepts, namely the principles and processes of developing sentences in a language.

Phonological processes are categorized as syllable structure processes, substitution processes, or assimilatory processes. Syllable structure processes describe those sound changes that affect the structure of the syllable. Substitution processes describe those sound changes in which one sound class is replaced by another. Assimilatory processes describe changes in which a sound becomes similar to, or is influenced by, a neighboring sound of an utterance. (www.ablongman.com)

GENERATIVE PHONOLOGY THEORY

Generative phonology theory is a component of generative grammar that assigns the correct phonetic representations to utterances in such a way as to reflect a native speaker's internalized grammar. Noam Chomsky and Morris Halle founded the Generative School of Phonology in the late 1950s. Its basic premises are that phonological structure reflects the linguistic competence of the individual native speaker to compute a phonetic representation for the potentially infinite number of sentences generated by the syntactic component of the grammar and that this competence can be investigated in a serious scientific fashion. The generative point of view has become dominant in the field of linguistics and has had varying degrees of influence on other cognitive sciences. (Kenstowicz: <http://web.mit.edu>).

Phonological Rules

I. Derivations and underlying representations:

- a. A systematic modification of stored representations assembled into larger constituents undergoes systematic modification via a class of mental operations.
- b. An underlying or phonological representation will contain all and only the unpredictable (distinctive feature) information for each lexical item.
- c. Predictable features of pronunciation are added to the underlying phonological representation by grammatical rules and principles.
- d. These rules operate on the basis of the information in the lexical item's phonological representation on an underlying form and the context in which it is located.

II. Phonological Rules are of two types:

Allophonic rules: fill in qualities of pronunciation that are absent in the lexical forms of morphemes but are required by their circumstances in speech, like the aspiration of word-initial /k/ in *coats* and the rounding of the word-initial /r/ of *rules*.

English stop aspiration:

Rule 1: Voiceless stops are aspirated when in initial stressed syllables

Rule 2: Nouns, main verbs, adjectives and adverbs have at least one stressed vowel.

Morphemic rules: also known as morpho-phonemic rules and morpho-phonological rules change or choose between meaningful qualities given as part of the lexical entries of morphemes, as where voicing of the /z/ of the plural suffix is replaced by voicelessness, giving /s/, in words like /kəʊts/ *coats* and /sɒks/ *socks*.

PHONOLOGICAL PROCESS

Assimilation

Assimilation is the process of changing one phoneme into another phoneme as the result of putting morphemes together (Ramelan, 1994: 171). Assimilation is one type of morpho-phonemic changes. On the basis of which sound influences the assimilated sound, we distinguish two kinds of assimilation: progressive assimilation, when the change of one sound into another one is influenced by a preceding sound, and regressive assimilation, when it is influenced by the following sound (Ramelan, 1994: 172). With regard to the types of changes that the assimilated sounds undergo, we can distinguish assimilation of place of articulation which involves a change in place of articulation, assimilation of manner of articulation which involves a change in the manner of articulating the consonants, and assimilation of voice involves a change in the voicing of

the assimilated sound (Ramelan, 1994:173). Assimilation is said to be complete when the assimilated sound is completely changed into the same sound as the sound that affects the change, and it is said to be partial when the change is not complete, but only partial (Ramelan, 1994: 174).

A. Regressive Assimilation.

As it is stated above, the regressive assimilation occurs when the change of one sound into another one is influenced by the following sound.

Consider the following data:

/m-/ → [m-]

/m-/ + /'pɒsəbl/ → [m'pɒsəbl]

/m-/ + /'prɒbəbl/ → [m'prɒbəbl]

/m-/ + /'prɒpə/ → [m'prɒpə]

/m-/ + /'pjʊə/ → [m'pjʊə]

/m-/ + /'peɪfənt/ → [m'peɪfənt]

/m-/ + /'pɜ:fekt/ → [m'pɜ:fekt]

/m-/ + /pɔ:tənt/ → [m'pɔ:tənt]

/m-/ + /pɑ:fəl/ → [m'pɑ:fəl]

/m-/ + /præktɪkəl/ → [m'præktɪkəl]

/m-/ + /'bæləns/ → [m'bæləns]

/m-/ + /mə'tjʊə/ → [ɪ'mə'tjʊə]

/m-/ + /'mɒdərət/ → [ɪ'mɒdərət]

/m-/ + /'mɔ:təl/ → [ɪ'mɔ:təl]

/m-/ + /'mu:vəbl/ → [ɪ'mu:vəbl]

/m-/ → [m-] (remains the same)

/m-/ + /dɑː'rekt/ → [ɪndɑː'rekt]
/m-/ + /dɪ'pendənt/ → [ɪndɪ'pendənt]
/m-/ + /'tɒlᵻ'rᵻnt/ → [ɪn'tɒ:lᵻ'rᵻnt]
/m-/ + /'sʌfᵻ'rəbl/ → [ɪn'sʌfᵻ:rəbl]
/m-/ + /sə'fɪʃənt/ → [ɪnsə'fɪʃənt]

/m-/ → [ŋ-]

/m-/ + /kəŋ'klu:sɪv/ → [ɪŋkəŋ'klu:sɪv]
/m-/ + /'grætɪtʃu:d/ → [ɪŋ'grætɪtʃu:d]
/m-/ + /kəŋ'klu:sɪv/ → [ɪŋkəŋ'klu:sɪv]
/m-/ + /kən'sɪdᵻ'rət/ → [ɪŋkən'sɪdᵻ:rət]
/m-/ + /kᵻ'rekt/ → [ɪŋkᵻ'rekt]
/m-/ + /kəm'pli:t/ → [ɪŋkəm'pli:t]
/m-/ + /kən'vi:nɪᵻnt/ → [ɪŋkən'vi:nɪᵻnt]

/m-/ → [ɪn-] (remains the same)

/m-/ + /əd'vaɪzəbl/ → [ɪnəd'vaɪzəbl]
/m-/ + /ænɪmət/ → [ɪ'nænɪmət]
/m-/ + /ɔ:dɪnət/ → [ɪ'nɔ:dɪnət]
/m-/ + /ɪ'fektɪv/ → [ɪnɪ'fektɪv]

The /n/ sound (nasal) in the prefix /m-/ has the same place of articulation as the following consonant: [m] before [p, b, m]; [ŋ] before [k, g]; [n] before [t, d, s]. So, the /n/ sound (nasal) assimilates in place of articulation to the consonant followed.

Based on the above data, [ɪn] occurs in the most environments before vowels, t, d, and s. Therefore, **the underlying form is [ɪn-]**. This is also caused by the least environmental influences it receives; [ɪn-] does not change when it comes before morphemes beginning with vowels such as /ə/ in [ɪnəd'vaɪzəbl], /æ/ in [ɪ'nænɪmət], /ɔ/ in [ɪ'nɔ:dɪnət], or /ɪ/ in [ɪnɪ'fektɪv].

Rules 1:

/m/ → [ɪm] / — [p, b, m]

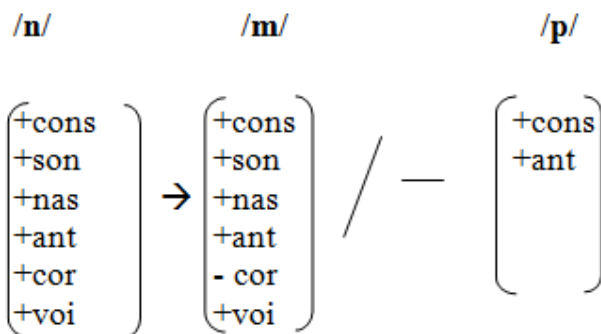
→ [ɪŋ] / — [k, g]

→ [m] / — [t, d, s, ə, æ, ɔ, ɪ]

/m/ becomes [ɪm] before [p, b, m], /m/ becomes [ɪŋ] before [k, g], and /m/ remains unchanged before [t, d, s, ə, æ, ɔ, ɪ].

Based on the phonological features of the consonants, the phonological process can be written as follows:

(1). /m-/ + /'pɒsəbl/ → [ɪm'pɒsəbl]

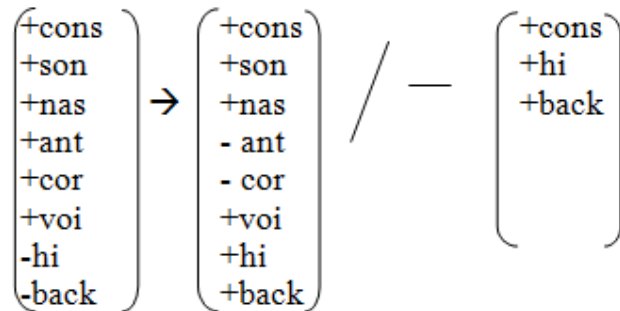


There is only one different feature between phonemes /n/ and /m/, namely the **coronal**:

[+cor] is the sounds of dental, alveolar, palato-alveolar, and palatal, while [-cor] is the sounds of labial, velar, uvular, and faringal. Meanwhile, /n/, /m/, and /p/ have the same feature in that they are all consonantal and anterior. [+cons] is the obstruent sounds, fricative and affricate sounds, nasal and liquid sounds. [+ant] is the sounds of labial, dental and alveolar. The phoneme /b/ which is voiced bilabial plosive is placed at the same position as the phoneme /p/.

The prefix [in-] becomes [im-] in impossible, improbable, improper, impure, impatient, imperfect, and imbalance because it is influenced by the following sound /p/ or /b/ (voiceless/voiced bilabial plosive) of the following morpheme. This is called regressive assimilation as the change of one sound into another is influenced by the following sound. With regard to the type of changes: [in-] in impossible, improbable, improper, impure, impatient, imperfect, and imbalance is replaced by [im-] before words beginning with bilabial plosive. There is a change from /n/ into /m/, therefore it is called an assimilation of place of articulation: alveolar nasal becomes bilabial nasal.

(2). /in-/ + /kəŋ'klu:sv/ → [ɪŋkəŋ'klu:sv]
 /n/ /ŋ/ /k/



The phonemes /n/ and /N/ have four different features, namely anterior, coronal, high, and back. [+ant] is the sounds of labial, dental, and alveolar; [-ant] is the sounds of palato-alveolar, palatal, velar, uvular, and faringal; [+hi] is the sounds of palatal, velar, and high vowels; [-hi] is the sounds of labial, dental, uvular, faringal, middle and low vowels; [+back] is the sounds of velar, uvular, faringal, and back vowels; [-back] is the sounds of labial, dental, palatal, and front vowels. For the features of coronal, see (1) above. Three same features are possessed the phoneme /ŋ/ and /k/, namely [+cons], [+hi] and [+back]. The phoneme /g/ which is voiced velar plosive is placed at the same position as the phoneme /k/.

The prefix [in-] becomes [iŋ-] in [ɪŋkəŋ'klu:sv], [iŋ'grætɪtju:d], [ɪŋkən'sɪdʳət], [ɪŋkʳ'ekt], and [ɪŋkəm'pli:t] because it is influenced by the following sound /k/ or /g/ (voiceless/voiced velar plosive consonant) of the following morpheme.

Based on the place of articulation the above data are written as follows:

/in/ → [ɪm] / — bilabial consonants

→ [iŋ] / — velar consonants

So, based on the phonological features we can make the second rule (Rule 2):

When the prefix [in-] is combined with a morpheme beginning with a bilabial consonant, it will change its form into [ɪm], when it is combined with a morpheme beginning with a velar consonant, it will change its form into [iŋ].

B. Progressive Assimilation.

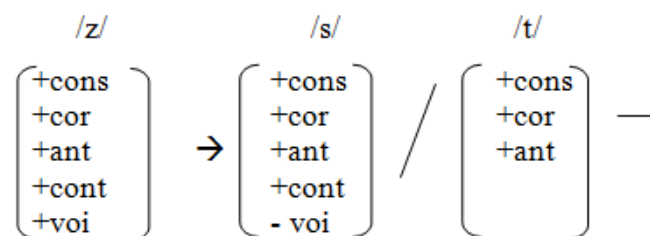
As has been mentioned before, progressive assimilation occurs when the change of one sound into another one is influenced by a preceding sound.

Look at the following data:

It's here /ɪt/ + /ɪz/ /hiə/ → [ɪtʃhiə]

That's all /ðæt/ + /ɪz/ /ɔ:l/ → [ðætso:l]

The word 'is' /ɪz/ is first reduced into /z/ in an unstressed syllable, then /z/ is assimilated into the voiceless fricative /s/ because it is influenced by the preceding sound /t/.



The /z/ in [ɪz] sound changes into /s/ sound when it is assimilated with the preceding voiceless alveolar plosive /t/.

Other Morpho-phonemic Changes

Morphemes can undergo morpho-phonemic changes when they are combined with other morphemes. One type of these changes is called assimilation as explained above.

Here are other types of morpho-phonemic changes:

1. Elision

This dropping of sound takes place especially because morphemes are put close to each other and also because of their occurrences in unstressed syllables or in rapid speech. (Ramelan, 1977: 174). According to Roach (1983:108) under certain circumstances sounds disappear, or in a certain circumstances a phoneme may be realized as zero, or have zero realisation; elision is typical of rapid, casual speech; the process of change in phoneme realisations produced by changing the speed and casualness of speech, which is sometimes called gradation.

Consider the following data:

/nekst/ /dɔ:z/ → [neksdɔ:z]

next door is pronounced /neksdɔ:z/ → /t/ of /nekst/ is dropped

must go is pronounced /mæsgəʊ/ → /t/ of /must/ is dropped

last month is pronounced /la:smʌntθ/ → /t/ of /last/ is dropped

must not is pronounced /mʌsnt/ → /t/ of /mast/ is dropped

Rule 1:

/t/ → ∅ / - [d, g, m, n]

/t/ becomes zero (is dropped) before [d, g, m, n].

$$\begin{array}{c} /t/ \\ \left(\begin{array}{c} +\text{cons} \\ +\text{cor} \\ +\text{ant} \\ -\text{voi} \end{array} \right) \end{array} \rightarrow \emptyset / - \begin{array}{c} /d/ \\ \left(\begin{array}{c} +\text{cons} \\ +\text{cor} \\ +\text{ant} \\ +\text{voi} \end{array} \right)$$

The features of /t/ and /d/ are all the same except for voice; /t/ is [-voi] and /d/ is [+voi]. [+voice] is all voiced sounds, and [-voice] is all voiceless sounds.

Rule: /t/ is dropped before voiced alveolar.

$$\begin{array}{c} /t/ \\ \left(\begin{array}{c} +\text{cons} \\ +\text{cor} \\ +\text{ant} \\ -\text{voi} \end{array} \right) \end{array} \rightarrow \emptyset / - \begin{array}{c} /g/ \\ \left(\begin{array}{c} +\text{cons} \\ +\text{hi} \\ +\text{back} \\ +\text{voi} \end{array} \right)$$

Rule: /t/ is dropped before voiced plosive velar.

$$\begin{array}{c} /t/ \\ \left(\begin{array}{c} +\text{cons} \\ +\text{cor} \\ +\text{ant} \\ -\text{voi} \end{array} \right) \end{array} \rightarrow \emptyset / - \begin{array}{c} /m/ \\ \left(\begin{array}{c} +\text{cons} \\ +\text{son} \\ +\text{ant} \\ +\text{voi} \\ +\text{nas} \end{array} \right)$$

Rule: /t/ is dropped before voiced nasal bilabial.

$$\begin{array}{c} /t/ \\ \left(\begin{array}{c} +\text{cons} \\ +\text{cor} \\ +\text{ant} \\ -\text{voi} \end{array} \right) \end{array} \rightarrow \emptyset / - \begin{array}{c} /n/ \\ \left(\begin{array}{c} +\text{cons} \\ +\text{son} \\ +\text{ant} \\ +\text{cor} \\ +\text{nas} \end{array} \right)$$

Rule: /t/ is dropped before voiced nasal alveolar.

Rule 2: /t/ is dropped before voiced consonants.

2. Addition of Sounds

Consider the following data:

The following show the addition of the sound /n/:

/sʌləm/ + /-ity/ → [sʌləmnɪti]

/m/ → [mn] /- [-ity]

/m/ becomes /mn/ before /-ity/

/hɪm/ + /-al/ → [hɪmnəl]

/m/ → [mn] /- [əl]

/m/ becomes /mn/ before /-əl/

/kən'dem/ + /-ation/ → [kʌndəm'neɪʃən]

/m/ → [mn] /- [-ation]

/m/ becomes /mn/ before /-ation /

CONCLUSION

As generative phonology theoretically suggests, one rule can apply in many other niches of the same phonological context, and this supports a theory that language is really rule-governed behavior. By learning assimilations, regressive and progressive, and other morpho-phonemic changes such as elision and addition of sounds, we will get better understanding on the phonological changes which occur when two sounds are linked together. When we know for sure the changes occurred in certain combinations, it will make us more confident in teaching English language to our students, especially concerning the assimilation, elision and addition of sounds.

REFERENCES

Cambridge Advance Learners Dictionary, third edition, online dictionary.

Chomsky, N. (1962). *Current issues in linguistic theory*. The Hague: Mouton.

Kenstowicz, Michael *Generative Phonology* Massachusetts Institute of Technology Department of Linguistics MIT 77 Massachusetts Avenue Cambridge, MA 02139 United States (<https://www.ualgary.ca/dflynn/files/dflynn/Kenstowicz.pdf>, accessed May 2012)

Odden, David (2005), *Introducing Phonology*, Cambridge University Press, New York.

Ramelan, Prof. Dr.M.A. (1994) *English Phonetics*. UPT UNNES PRESS, 2 Kelud Raya Street, Semarang, Indonesia

<http://www.sil.org/linguistics/GlossaryOfLinguisticTerms/WhatIsGenerativePhonology.htm>, (accessed May 2012)

http://web.mit.edu/linguistics/people/faculty/kenstowicz/generative_phonology.pdf, (accessed May 2012)

THEORETICAL CONSIDERATIONS AND PRACTICAL APPLICATIONS

http://www.ablongman.com/html/productinfo/bauman3e/020554925X_ch04.pdf (accessed May 2012)