MODULE 3 PHONOLOGY

UNIT 1 SOUND PATTERNING IN ENGLISH: CONSONANTS

CONTENTS

1.0 INTRODUCTION

In the last module, you were introduced to the phonetic description of English; this module introduces you to the phonological description of English sounds. This first unit brings to your attention the sound patterning: grouping and organisation of English sounds. In this unit, you are going to study the patterning of sounds in English, with particular focus on consonants. The issues concerned relate to manner/place of articulation as well as the state of the glottis at the time of production.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- identify the consonant sounds of English;
- describe the production process of the English consonants; and
- recognise the consonant sounds according to the states of the glottis and the position of the vocal lips/cords.

3.0 MAIN CONTENT

3.1 Consonants

The previous module introduced you to consonants and vowels as the basic sounds of English. However, there are many more features of consonants which we need to be familiar with if our mastery of this set of basic sounds is to be adequate.

In their production, consonants show greater constriction of the vocal tract and are less sonorous, less prominent than their counterpart – the vowels. In a majority of the world's languages, a vowel can serve as a syllable or a word, but a consonant cannot, except it is accompanied with a vowel. Although we can produce certain sequences like mm, mmn, sh, shr, zsr, etc. (all made up of consonants), such sequences cannot rightly be claimed to belong to any particular language, they are simply identifiable human sounds which may express some kinds of emotion in certain situations. In a majority of the world languages also, the consonants are marginal or peripheral in the structure of words while the vowels are central in such structural patterning.

In the production of consonant sounds generally, there are three operative terms which all students of the subject should be firmly knowledgeable about. These are the terms plosive, fricative and nasal. Practically all natural languages have plosive consonants, fricative consonants and nasal consonants, in varying numbers and in varying distributional patterns.

In the realisation of a plosive consonant, four stages described here in sporting terms are notable:

(i) Two articulators come together – the articulators may be the lips coming together; the tongue moving up to be in contact with the teeth ridge (alveolar ridge) or the back part of the tongue being in contact with the soft palate. We may refer to this as the preparatory or the "on-your-marks" phase.
(ii) The air from the lungs is now held completely in check; the united organs prevent it from escaping. We can call this the 'get-set' phase.
(iii) There follows a sudden parting of the organs, a process which allows the imprisoned air to escape. This is the 'go' or the 'plosion' phase.
(iv) What follows immediately in the wake of the plosion may be voicing or noiselessness depending on the action of the vocal lips: vibration or absence of it. We may call this the post-plosion (the "pp" stage).

These four stages are applicable to the articulation of plosive consonants in practically all natural languages. From these four stages we can also appreciate why plosive consonants are sometimes referred to as stop consonants.

With respect to English, six consonant sounds /p, b, t, d, k, g/ are often realised following the four stages outlined above. Of these six, /b,d,g/ are generally said to be voiced (even if they are not equally vigorously voiced in all word positions), while /p, t, k/ are generally said to be voiceless. It has also generally been claimed that the voiceless plosives are produced with a great exertion of energy and so the consonants are said to be strong or fortis.

On the other hand, it is generally claimed that the realisation of the voiced plosives /b,d,g/ takes a comparatively less exertion of energy in their realisation and so the plosives are said to be weak or lenis. The terms fortis and lenis are however not restricted to English alone. Indeed, any language in which the dichotomy of energy exertion is observable may employ the terms for the description of plosive or any other consonant sounds for that matter.

The next term in our preliminary discussion of consonant is fricative. Fricative consonants are realised when articulating organs get near to each other, leaving a small space between them. Because of the narrowed space, the air that passes through makes some kind of hissing sound. Such consonants are often said to be continuant consonants, and this is because of the fact that the fricative sounds can be continued almost indefinitely so long as the speaker has enough air to continue the pronunciation at any given time.

The last of our operative terms is nasal. Nasal consonants are those which are realised through the link with the nose. For this to happen, the soft palate must be lowered to cover the mouth cavity and this allow the nasal cavity free for the air to pass through. In all natural languages, consonants of this class exist and are explicable in terms of this kind of lowering of the soft palate. This possibility of lowering the soft palate during sound production presupposes that even oral sounds can be nasalised, (for illustration or for any other reasons).

The process of nasalised is a very crucial one in sound production because it makes the important difference between two sets of sounds – oral and nasal. Ordinarily, all vowels and all consonants produced without a lowering of the soft palate belong to one class – oral sounds. All other sounds which pass through the nose cavity are nasal sounds. In a majority of the world's languages, all nasals are voiced. So, in a

detailed description of a nasal, it is superfluous to say something like. Voiced velar nasal for /N/. It is enough to say: velar nasal.

3.2a A Summary of Consonant Patterning

Consonants in English may be patterned according to place of articulation. Here, from the view point of:

(i) place of articulation, English has four bilabial consonants – those sounds realised between the two lips: /p,b,m,w/
(ii) two labio-dental consonants – those sounds realised with the lower lip and the upper front teeth: /f,v/
(i) two interdentally (or dental) consonants – those sounds realised with the tip of the tongue between the two rows of teeth: /θ,ð/
(ii) seven alveolar consonants – those sounds realised with the tip of the tongue at the teeth ridge (alveolar ridge): /t,d,l,n,r,s,z/
(iii) four palatoalveolar consonants – those sounds realised with the tip of the tongue simultaneously against the hard palate and the teeth ridge: /ʃ,ʒ,ʧ,ʤ/
(iv) one palatal consonant – the sound realised with the tongue touching the hard palate /j/
(v) three velar consonants – those sounds realised with the tongue touching the soft palate: /k,g,ŋ/
(vi) one glottal consonant – the sound realised in the glottis: /h/

This grouping of consonants according to place of articulation can be brought together thus:

Bilabial: /p,b,m,w/
Labiodental: /f,v/
Dental or interdental: /θ,ð/
Alveolar: /t, d, s, z, l, n, r/
Palato-alveolar: /ʃ,ʒ,ʧ,ʤ/
Velar: /k,g,ŋ/
Glottal: /h/

From the viewpoint of manner of articulation, English has the following consonants:

(i) six plosive (stop) consonants – those sounds realised through the bringing together of the articulating organs and a sudden release of the sounds (or a sudden parting of the organs): /p,b,t,d,k,g/
(ii) nine fricative consonants – those sounds realised through a narrowing of the space between the articulating organs and a filtering through of the sound, resulting in some kind of hissing: /t,v,θ,ð,s,z, ʃ,ʒ,h/

(iii) two affricate consonants – those sounds realised through the bringing together of the articulating organs – similar to the plosives, the difference being a less sudden release of the sounds: / ʧ,ʤ/

(iv) three nasals /m,n,ŋ/ - those with air passing through the nose at the time of production, following a lowering of the velum;

(v) two liquids /l,r/ - the various kinds of /l/ and /r/ sounds in various environments. During the production of the liquid lateral /l/ in particular, one or both sides of the tongue are lowered while the middle is raised, causing the air to flow out from the sides of the mouth as against the centre of the oral cavity.

(vi) two semi-vowels /j,w/ - realised sometimes like vowels, sometimes like consonants.

Information on this grouping may be seen at a glance thus:

Plosives:	/p,b,t,d,k,g/
Fricatives:	/f,v,θ,ð,s,z, ʃ,ʒ,h/
Affricates:	/ ʧ,ʤ /
Nasals:	/m,n,ŋ/
Liquids:	/l,r/
Semi-vowels:	/j,w/

3.2b

Consonants may be grouped from the viewpoint of observed state of the glottis – whether there is or there is no vibration of the vocal lips at the time of production of the sound. As already known, vibration of the vocal lips leads to the production of voiced consonants; absence of vibration of the vocal lips leads to noiselessness. The voiced consonants from the broad indications are;
/b,d,g,v,ð,ʒ,ʤ,m,n,ŋ,l,r,j,w/ the voiceless consonants are: /p,t,k,f,θ,s,ʃ,h, ʧ/

SELF-ASSESSMENT EXERCISE

Distinguish between plosives and fricatives.

4.0 CONCLUSION

In this unit, you have used the exposure to the concept of phonemes and sounds to group the consonants of English. You have done so according to manner of articulation, place of articulation and state of the glottis at the time of speech production.

5.0 SUMMARY

You have in this unit, specified the grouping (patterning) of the consonant sounds according to the following criteria.

(i) voicing and vibration of the vocal lips/cords;
(ii) the manner of articulation;
(iii) the place of articulation.

We are now ready to go on to the patterning/grouping of the vowel/phonemes.

6.0 TUTOR-MARKED ASSIGNMENT

Mention the criteria and then group the consonants of English.

7.0 REFERENCES/FURTHER READING

Abercrombie, D. (1975). *Elements of General Phonetics.* Edinburgh: Edinburgh University Press.

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UNIT 2 SOUND PATTERNING IN ENGLISH: VOWELS

CONTENTS

1.0 INTRODUCTION

In this unit, you are exposed to the patterning, grouping and organisation of the vowel sounds according to their relative duration; according to the part of the tongue raised and according to the extent of the raising of the tongue towards the roof of the mouth.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- separate vowels from the standpoint of their relative duration;
- identify the vowels according to the part of the tongue raised;
- organise the vowels according to the extent of the raising of the towards the roof of the mouth; and
- identify vowels based on the lip posture.

3.0 MAIN CONTENT

The English language has a total of twenty vowels, twelve pure vowels and eight diphthongs. Pure vowels, also called monothongs, are those vowels which are produced by the movement of the tongue in one direction only. Pure vowels are also described as simple vocalic sounds that are said to have ‘a steady state articulation’, implying that the tongue, lips and jaw achieve, however briefly, a stable configuration, commonly called Target Configuration, if produced in isolation (Clark & Yallop, 1990:73). It is common knowledge that the tongue and lips undergo transitions in anticipation of a sound that follows or was produced before another sound but these transitions notwithstanding, a vowel sound which appears to have a stable auditory quality qualifies to be called a pure vowel.

The diphthongs are often characterised by a glide from one vowel position to another. In such vocalic sounds, according to (Clark & Yallop, 1990: 73), 'the glide component is so prominent even though it is still heard as a single sound.' Unlike the pure vowels, they are not tied to conventional numbers. The word diphthong comes from Greek. It means 'double sound.' The first vowel in diphthong marks the starting point while the second sound marks the direction of tongue movement. The first vowel is often longer and louder than the second. Diphthongs are often transcribed, using diagraphs made up of two vowel symbols, which represent the starting point and the direction of movement of the tongue during articulation. The eight English diphthongs are thus:

[ei] as in day, make, great, late
[ai] as in time, light, try, buy
[ɔi] as in boy, noise, joy, buoy
[əu] as in both, soap, know, sold
[ɑu] as in sound, town, owl, cow
[iə] as in dear, idea, hero, here
[uə] as in poor, sure, tour, truant
[eə] as in share, pair, wear, Mary

In addition to eight diphthongs, we also have five triph thongs. In careful and slow pronunciation, it is often possible to distinguish three vowel sounds articulated together. These are called triph thongs. For example, a careful pronunciation of the vowel in the word 'tower' shows three vowels in one sound thus: [tɑuə].

In English, there are five triphthongs made up of the five closing diphthongs with schwa [ə] added to them. Thus we have

[ei] + [ə] – [eiə] as in player, layer
[ɑi] + [ə] – [ɑiə] as in fire, tyre
[ɔi] + [ə] – [ɔiə] as in royal, loyal
[əu] + [ə] – [əuə] as in sower, lower
[ɑu] + [ə] – [ɑuə] as in flower, tower

In each case, the glide is from the first sound to the sound and to the third. As already noted, it is only the slow and careful English speaker whose speech can feature these complex vowels. In rapid or normal speech, triph thongs are often reduced to long vowels and diphthongs with the middle vowel heard only slightly or not at all. The grouping of these vowels can be at a glance in Section 3.1 below.

3.1 Grouping of the Vowel Sounds of English

The vowel sounds of English may be grouped, first, following the relative duration of the sounds. Here, four subgroups are generally recognised. These are:

i) Long mono thongs (pure vowels): [iː, ɑː, ɔː, uː, əː]
ii) Diphthongs (glides): [ei, ɑi, ɔi, əu, ɑu, iə, eə, uə]
iii) Tripthongs [eiə, ɑiə, ɔiə, əuə, ɑuə]

As you already know, the above are all long vowels.

iv) Short mono thongs (pure vowels): [ɪ, e, æ, u, ʌ, ə]

Secondly, the vowel phonemes of English may be grouped according to the part of the tongue rose. There are three subgroups of vowels here:

i) Front [iː, ɪ, e, æ]
ii) Back [ɔ, ɔː, u, uː]
iii) Central [ʌ, ə, əː]

There is a vowel that does not neatly fit into any of these three subgroups. It is [ɑː] usually grouped as nearer back than front.

Thirdly, the vowel phonemes of English may be grouped according to the extent of rising of the tongue towards the roof of the mouth. Six subgroups are generally noted here:

i) Close [iː, uː]
ii) Half-close [ɪ, u]
iii) Half-open [ʌ]
iv) Between ii) and iii) [e, əː, ə]
v) Open [ɑː]
vi) Between iii) and v) [æ]

The close vowels [iː, uː] may, alternatively, be grouped as high vowels; the half-close and half-open [ɪ, u, ʌ] may be said to be mid vowels while the open vowel [ɑː] may be said to be low vowels.

With regard to the position of the lips at the time of pronunciation,

i) [uː, ɔː]
ii) [u, ɔ]
iii) [iː, ɪ, e, æ, ʌ, əː, ə, ɑː] are realised with spread or neutral lips.

SELF-ASSESSMENT EXERCISE

How are diphthongs and triphthongs similar to long mono thongs?

4.0 CONCLUSION

In this unit, you have studied four main groups in relation to the vowels sounds of English. You have also seen that the vowels of English are quite complex and can pose problems of organisation, patterning or grouping. However, the different formats of patterning based on the duration of pronunciation, the extent to which the tongue is raised, and lip rounding were all used as the parametric determinants of the vowels of English.

5.0 SUMMARY

From this unit, you have learnt the grouping of vowels according to:

i) their relative duration;
ii) the part of the tongue raised towards the roof of the mouth;
iii) the extent of raising of the tongue; and
iv) according to the position of the lips.

6.0 TUTOR-MARKED ASSIGNMENT

Attempt a brief grouping of vowels sounds of English according to the part of the tongue raised to the roof of the mouth and the extent of such a raising.

7.0 REFERENCES/FURTHER READING

Abercrombie, D. (1975). *Elements of General Phonetics.* Edinburgh: Edinburgh University Press.

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UNIT 3 THE PHONEME AND ALLOPHONE

CONTENTS

1.0 INTRODUCTION

This fourth unit takes you into another very important set of issues in your course – the phoneme and the allophone. You are taught the meaning of both terms and the relationship which holds between them.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the terms phoneme and allophone;
- analyse the relationship between the two; and
- illustrate how one symbol could be used to indicate both the phoneme and the allophone.

3.0 MAIN CONTENT

3.1 The Phoneme

We saw in unit 2 of Module 1 that of the major components of language, sounds stand out as easily the most important. We also noted that a sound segment which is capable of changing meaning when replaced by another segment is said to be significant, contrastive or distinctive. A significant sound segment may be said to represent a phoneme, but it is very important to note that the phoneme itself is an abstraction – something which exists in our thought. A phoneme manifests itself in the form of a significant sound, so it is our realisation of the segments which is particularly important in natural language, not the isolation of the abstraction.

If we consider the phonological rank scale which has the tone group, the foot, the syllable and the phoneme, we can say that the phoneme is the smallest meaningful unit within a phonological rank scale. Hyman

(1975:59) defines the phoneme in a way similar to the above popular definition: "a minimal unit of sound capable of distinguishing words of different meanings." Thus, the sounds /r/ and /l/ are phonemes realised in English and shown to be responsible for the difference in meaning between the English words read /ri:d/ and lead /li:d/.

A traditional way of arriving at significant sounds in all natural languages (and hence phonemes in them), is through the construction of minimal pairs. If we take two words which appear the same (morphologically) except in one respect, the different sound which causes a change in meaning is the phoneme. For instance:

(i) pen, ten /pen/, /ten/
(ii) right, fight /rɑit/, /fɑit/
(iii) sing, king /sɪŋ/, /kɪŋ/

The first sound in each group - /p, t, r, f, s, k/ is a phoneme.
(i) in setting up minimal pairs, we should be careful to note that even though the initial sounds in each pair are important in signalling differences in meaning, the remaining sounds in each pair are also representative of phonemes because a change in any of them will bring about a change of meaning.

SELF-ASSESSMENT EXERCISE

Briefly distinguish between the terms sound and phoneme.

3.2 The Allophone

A single phoneme can be realised (pronounced) in different ways depending on where the sound occurs in the word. For instance, the English sound / p / may be aspirated word initially as shown in unit 2, Module 1, and would be shown thus [ph]. The same sound /p/ in the middle of a word will most likely be unaspirated [p] at the end of a word the same /p/ sound may be unreleased [p̚]. These three "different" /p/ sounds realised as [ph, p, p̚] are all allophones of the same phoneme /p/. If we take Jones' (1931:74) definition of the term phoneme as "a family of sounds made up of an important sound and various realisations of that sound" we can come to the conclusion that in the words *park, spark,* and *wrap* the phoneme /p/ is the important sound and [ph] and [p] and [p̚] are members of the family representing three different realisation: word initially [ph], word medially [p] and word finally [p̚]. We shall revisit the phoneme and the allophone in Module 3, Unit 11 – when we shall be dealing with phonological system and structure.

4.0 CONCLUSION

From this unit, we have seen that the phoneme is the smallest meaningful phonological unit of analysis while the allophones are varied forms of the phoneme. We have also shown that both the phoneme and the allophone play important roles in the analysis of the sounds of any natural language.

5.0 SUMMARY

In this unit you have studied two separate but related issues in the analysis of sounds in natural languages. You have noted why it is generally said that a phoneme is a family of sounds while the allophones can be said to be members of the family of a phoneme. You are therefore in a position to appreciate the next topic: organs of speech.

6.0 TUTOR-MARKED ASSIGNMENT

Briefly distinguish between phonemes and allophones.

7.0 REFERENCES/FURTHER READING

Abercrombie, D. (1975). *Elements of General Phonetics*. Edinburgh: Edinburgh University Press.

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UNIT 4 PHONOLOGICAL PROCESSES 1

CONTENTS

1.0 INTRODUCTION

In unit 2, you were exposed to the meaning and procedure of Phonology. In this unit, you will learn the coverage of Phonology, its system and its structure.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the coverage of phonology;
- distinguish between phonological system and structure; and
- discuss freely key issues in phonological structure.

3.0 MAIN CONTENT

3.1 Phonological Study: The Coverage

We have already known that when we talk about phonology, we are concerned with the way the sound system of a particular language is organised. We have also known that when we talk about the sound system of a given language we usually mean the number of phonemes or distinctive and significant sounds as well as the variations of sounds which may be occasioned by the phonological environment in which the sounds of such a language occur. This issue of variations is sometimes simplified to mean the position in which a given sound occurs in a word: whether word initially, word medially or word finally. All of the above may be referred to as the segmental phonology of a particular language.

In addition to the above, phonological studies are also concerned with features such as those of accentuation; pitch intonation or nasalisation which extends to more than one segment in an utterance. When this happens, the phonological study is said to be concerned with non segmental phonology. The term suprasegmental is also used in some sources, particularly the early ones… to describe what happens in relation to non segmental phonology. The prefix –supra – suggests that the features are simple attached to the segments, whereas they run over a segment. So the term non segmental is apparently more descriptive of the functions of features such intonation and rhythm. Module 4 of your course is devoted to aspects of non segmental phonology of English.

SELF-ASSESSMENT EXERCISE

Briefly distinguish between segmental and non segmental phonology.

3.2 Phonological System

A phonological system is generally concerned with phonological units which are significant and/or contrastive and are therefore differentially replaceable with other significant units within a given language. Such units constitute the core of the phonological system. A major feature of the phonological system is that the units in each system have the function of distinguishing or isolating words and changes in words as a result of occurrence in mutually inclusive environments. They have little or no opportunity of influencing each other with regard to pronunciation since they enter vertical arrangements.

Phonological units in vertical arrangement are usually said to be those in paradigmatic distribution. They are separate and are realisable generally in isolation. If we take the words (a) port (b) keen and (c) milk for example and arrange the contrastive sound units paradigmatically, we notice the following:

A	B	C
p	k	m
ɔ:	i:	ɪ
t	n	l
		k

An analysis of these entries shows that in A the /p/ cannot be said to be aspirated neither can we claim that the voiceless consonant /t/ at the bottom of the first arrangement has had the effect of reducing the length of /ɔ:/ in any way. For the vowel sound in B there can be no claim that the /n/ at the bottom has led to the slightest attempt at nasalising /i:/.

In C the quality of the liquid lateral /l/ does not suggest that it has occurred in the middle of the word! It is as clear as it would have been if it had occurred at the beginning. All these show that items in paradigmatic distribution which form the core of the phonological system do not normally influence each other.

3.3 Phonological Structure

A phonological structure is generally concerned with phonological units which co-occur together in a horizontal arrangement. Such co-occurrence is generally known to exhibit reciprocal influences as a result of nearness to each other. For instance, if a long sound occurs at the end of a word, it is likely to remain long in a normal pronunciation of words like;

bar /bɑː/
see /siː/
we /wiː/

But if these long sounds are arrested by consonants, for instance, if we now have

barred /bɑːd/
seen /siːn/
weed /wiːd/

The durations are slightly affected. If they were arrested by voiceless consonants, the durations of /ɑː/, /iː/ and /iː/ in *bar, see* and we would have been greatly reduced. These facts will become clearer to you when your programme takes you to a study of synchronic sound change. Also expect further clarification when we get to unit 3, Module 4. If however, we go back to our examples under phonological system – port, keen and milk, we are like to understand what happens under phonological structure. The arrangement would then be syntagmatic (as against the one of phonological system which we had as paradigmatic). The syntagmatic arrangement is horizontal thus:

port /pɔː t/
keen /kiːn/
milk /mɪlk

In the first illustration, the influence of /t/ ending the word /pɔː t/ is to reduce the length of /ɔː/ drastically.

In the second illustration, the influence of the nasal /n/ is to create a situation of partial nasalisation for the vowel /iː/.

In the third illustration, the occurrence of the liquid (lateral) /l/ word medially shows that ordinarily the /l/ cannot be clear; it must be dark or velarised. This is so because in English the clear /l/ occurs at the initial stage. Medially and finally, the /l/ becomes dark and is represented thus: /ɬ/. Milk would then be shown to be /mɪɬk/.

Indeed, a lot of reciprocal influences occur with items in phonological structure and with syntagmatic distribution which marks the core of the phonological structure. However, we shall take a look at two more issues in connection with the phonological structure. These are complementary distribution and free variation.

3.4.1 Complementary Distribution

Within the phonological structure of English, there are sounds which enter into complementary distribution. Such sounds are normally allophones of phonemes. Allophones in complementary distribution are those which cannot be replaced by other allophones without bringing about a change in the meaning of the words concerned. Put differently, sounds in complementary distribution occur in mutually exclusive environments: they have no contexts in common.

If we take the /l/ sound, we notice that word initially it is always clear /l/; word medially and finally it is usually dark or velarised: /ɬ/. So, normal speakers of English cannot use the clear /l/ word medially or finally just as they cannot use the dark /ɬ/ word initially. Notice that the dark /ɬ/ is usually written with a tilde across it /ɬ/.

In a similar way, if we take three words: cat, Kate and caught, we notice that each starts with [k] which is an allophone of /k/. But the [k] in cat is "different" from the [k] in Kate and both are "different" from the [k] in caught. But the differences are not significant: the /k/ sounds adjust themselves to the nearby vowels - /æ/ in /kæt/, /ei/, in /keit/ and /ɔ:/ in /kɔ:t/. This is the sense in which the [k] sounds are allophones of /k/.

3.4.2 Free Variation

Within the phonological system of English there are contrastive items which may be used not for the purpose of bringing about a change in the meaning of a given word, but with the intention of bringing about a change in pronunciation. When this happens, the items within the phonological system are seen to operate within the phonological structure, thus the words:

embrace may be pronounced ['embreis] or ['ɪmbreis]
either may be pronounced ['ai:ðə] or ['i:ðə]
economics may be pronounced ['i:knɔmiks] or ['eknɔmiks]

It should be noted that free variation is not a universal event: there are many people who stick to the pronunciations they had learnt from the beginning or who are not easily influenced by speakers around them. But every speaker has the capacity to notice when sounds are used in free variation.

4.0 CONCLUSION

You have, in this unit, been exposed to coverage of phonology. You have also learnt additional very important issues in this unit: phonological system and phonological structure.

5.0 SUMMARY

The main issues discussed in this unit are:
(i) the coverage of phonology
(ii) phonological system – the core
(iii) phonological structure – syntagmatic/complementary distribution; free variation

6.0 TUTOR-MARKED ASSIGNMENT

Briefly distinguish between sounds in complementary distribution and those in free variation.

7.0 REFERENCES/FURTHER READING

Eka, D. (1996). *Phonological Foundations of English*. Uyo: Scholars Press

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UNIT 5 PHONOLOGICAL PROCESSES 2

CONTENTS

1.0 INTRODUCTION

Phonological processes are a common and predictable part of phonological development often recognised as simple pronunciation alteration. When phonemes are combined to form words, the segments of neighbouring phonemes become juxtaposed and sometimes undergo changes. Changes can also occur based on phonological environment. Such changes are found in word initial and word final positions in relation to a segment and are all referred to as 'phonological processes'.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- differentiate sound changes that occur in or within words;
- state what causes these changes;
- identify the relationship between sounds in a sequence;
- differentiate phonological processes; and
- discuss how phonological processes function in languages.

3.0 MAIN CONTENT

3.1 Phonological Processes

Phonological processes are the changes sounds undergo for occurring with other sounds in a particular phonological environment. They are a set of restructuring which link the underlying structure to the phonetic structure. It presents the realised sequence from the deep structure to the surface structure. One interesting aspect of the phonology of languages is that organised sounds of each language are not always static. They are constantly affected by the surrounding or neighbouring sounds, that is, the neighbouring segments always condition them. These conditioning are governed by rules called,' Phonological Rules'.

Sometimes phonological changes are not merely strictly phonological, changes may occur in the morphology or syntax that warrant a phonological change'

Phonological rules have to be exact in its scientific account of linguistic analysis. As such the rule should be scientifically and rotationally represented:

X ⟶ y / b

In the formula above, 'X' which is the main focus of the analysis refers to the input to the alternation, while 'y' shows the feature changed to by rule application. The slant '/' refers to the context or environment which the change occurs.

One important thing about this formula is that any of the elements (x, y, b) could be null. This makes it possible to capture different phonological processes within this formula. If in an analysis, we discover that the input 'x' is null, the rule will appear,

Ø ⟶ y / b

This kind of a change can be noticed in some varieties of spoken language. For example, most Nigerian languages do not tolerate consonant clusters. Whenever a Nigerian speaker of English as a second language comes across a word in English that has consonant clusters, he is likely to break the cluster and simplify the structure to suit his own language for easier articulation. For example,

'bread' /bred/ ⟶ (buredi)
CCVC ⟶ CVCVCV

In the above illustration, the English 'CCVC' structure has been simplified to 'CVCV' structure.

Phonological processes are the principles or norms which explain how abstract units are combined and vary when they are used in speech, such processes are assimilation nasalisation, dissimilation, coalescence, contraction, elision, neutralisation, metathesis, insertion etc.

3.1.1 Assimilation

Assimilation is a phonological process where a speech sound changes and becomes more like another sound, which follows or precedes it. e.g.:

Im – possible	impractical
In – tolerant	impatient
In – tangible	impartial
In – decent	immaterial
In – delible	indirect
In – sincere	imbalance

In the above, the forms with the prefix as 'im-' take bilabial plosives as /p/ and /b/, while those with 'in-'prefix take alveolar plosives. There is anticipation as both are articulated at the same place and this decides on what phoneme that is to follow.

On the other hand, the difference between /s/ in the English word 'cats' and the /z/ in 'dogs' is another kind of assimilation.

The most common phonological rule is assimilation, as every other process has its root in assimilation.

The functions of assimilation are:

- To save time
- To anticipate other sounds
- For ease of articulation

Assimilation is considered in terms of features as:

→ m/-b
ɱ/-f
n/-l or d
ŋ/-k
ŋm/-gb

Assimilation can be either;

(i) Progressive Assimilation: The assimilated sound follows the conditioned sound. It is a sort of hand over phenomenon. It is when the change proceeds from left to right.

man /mæn/
no /nəʊ/

Notationally, this can be captioned as;

/V/ → ˜V/N-

(ii) Regressive Assimilation (anticipatory) takes place from right to left (R – L). The assimilated sound proceeds (comes before) the conditioning sound.

bon /bɒn/

bomb / bɒm/

song /sɒŋ/

son /sʌn/

By rule application, the above phonological process can be rotationally stated:

V ⟶ ˜V /-N (before)

This means that a non nasal sound changes to a nasal sound in an environment before a nasal sound.

Nasalisation

Nasalisation is a phonological process whereby a non-nasal sound picks on the features of a nasal sound because it occurs in the same distributional environment. e.g.

sing [siŋ]

pin [pin]

pen [pen]

sand [sænd]

It is secondary articulation, which results from the process of assimilation.

Dissimilation

Dissimilation is a process whereby sounds become less similar to their surrounding segments. This process is less common than the assimilation. It creates distinctiveness in sounds in the same environment. In English the adjectival suffix –'al', has two phonetic realisations of '-al' or '-ar' e.g.

A		B		
Noun	- Adjective	Noun	-	Adjective
electric – electrical		angle	-	angular
culture – cultural		single	-	singular
region – regional		title	-	titular
orbit – orbital		circle	-	circular

When the '-al' is added to a word that already ends in '–l', it takes the form –ar, where the '–r' is dissimilar to the '–l' of the noun. However, there are exceptions to this rule(s).

Coalescence

This is a phonological process whereby two contiguous sounds are replaced by one which, though different from each of the two shares some properties in common with each of the two original sounds. In English coalescence occurs when a morpheme final alveolar plosive or fricative /t, d/ or /s, z/ is followed by [j], a palato – alveolar fricative results, mostly when the segment is followed by the suffix "-ion" e.g.,

relate /rileit/ relation /rileiʃən/

confuse /kɔnfju:z/ confusion /kənfju:ʒɔn/

Contraction

This is a phonological process whereby a sequence of two identical segments is reduced to one. This process is always identifiable with vowels and it is usually a direct result of vowel assimilation, but can also be found in consonant. This process is dominant in Nigerian languages e.g. Isoko

da	+	udi
drink water		
by assimilation		duudi
by contraction		dudi
drink water		

Vowel Reduction

Vowel Reduction is a phonological process whereby unstressed vowels are weekend to schwa, this process abound in English, e.g.

phone /fɔun/ phonemics /feəni:mIks/

phone /fɔun/ phonetics /fənetik/

photography /fəutegra:f/ photography /fətɒgrefI/

able /eibl/ ability /əbiləti/

super /su:pə) superior /sə:piərIe/

telegraphy /teləgra:f/telegraphy /təlegrəfi/

Elision /Deletion

This is a phonological process whereby a segment that had existed is lost or become zero. The process may affect a vowel or a consonant. Some segments that are heard in a deliberate or slow articulation of a word in isolation may get deleted/elided or lost in festination (fast speech) and this can even affect an entire syllable. Deletion exists in many forms:

(i) Aphaeresis: This affects a morpheme or a sound at initial position. This is initial deletion e.g. I have – I've
The lost could be diachronically (history) traced.
Other examples are:

Knight /nait/
Know /nəu/
Pneumonia /njiumənia/
Psychology /saikəlɒʤi/

(ii) Syncope (Syncopation) is the internal deletion e.g.
listen /lisn/
sword /sɔ:d/
often /ɒfn/
castle /kæsl/
plumber /plʌmə/
secretary /sektri/
chocolate /ʧɒkleit/

(iii) Apocope (Apocopation) is the deletion of the final segment e.g.
and /ə n/
last time /læstaim/
Apocopation abounds in French words borrowed into English e.g.
coup /ku:/
debut /debju:/
depot /depə u/
chalet /ʃæleI/
sachet /sæʃeI/

In French, the final vowel of the definite article 'le' and 'la' is always deleted if the following word begins with a vowel. This process prevents sequences of vowels from occurring across word boundaries and thus maintains the preferred 'CV' structure.

le gaison	[lə ga:ss]	The boy
le ami	[l'ami]	The friend (male
la fille	[la fiy]	The girl
la amie	[lamie]	The friend (female)

Neutralisation

This is a fact of language. It is a process, which takes place when two distinctive sounds (phonemes) in a language are no longer distinctive. This usually occurs in particular positions in a word. For example /t/ and /d/ are neutralised intervocallicaly (in between vowel sounds) in American English as in:

Betting	[beɹɪŋ]
Bedding	[be ɹɪŋ]

In German /t/ and /d/ do not contrast at word final positions e.g;

rat	[ra:t]
rat	[ra:t}

Metathesis

This is a phonological process whereby the order of segments is juxtaposed. The process involves movement, permutation or reversal of segments in a string. This is common in speech errors and children's language.

Some refer to it as spoonerism coined from Professor Spooner who liked juxtapositioning segment e.g.

professor	prossefor
ask	aks
comfortable	comfterble
certificate	cerfiticate
relevant	revelant
disc	dics

This process has shaped many English words historically. The discrepancy between some spellings and pronunciations is caused by metathesis. For example, 'iron'. Even 'bird' in English was once 'bryd', 'run' was once 'irnan', 'horse' was 'hros', 'wasp' was 'wæps', and 'hasp' 'hæps'.

4.0 CONCLUSION

Phonological processes are the natural facts of languages. It is natural because it is common among all the languages of the world. Phonological processes are the changes phonemes undergo because they happen to occur with other sounds in the same environment. The most common of all the processes is the 'Assimilation'. All other processes like nasalisation, metathesis, neutralisation, insertion, deletion etc can be traced to assimilation process.

5.0 SUMMARY

Phonological process is the change sounds undergo for occurring in the same environment with other sounds. These changes could be phonological, morphological and syntactic. Phonologically, a sound change can be conditioned based on phonological environment as in

'physics' /fiziks/. The 's' changes to /z/ because it occurs in between two vowel sounds. The sound's' is a voiced, while 'y' and 'i' consonant are voiced sounds. The voiceless sound /s/ has to change to [z] a voiced sound to be like 'y' and 'I' in terms of voicing. It could be morphologically conditioned when it happens across word boundary. Consider the English regular past tense formation '-ed' and the regular plural suffixation '-s'. These processes are meant for ease of articulation, save time and anticipation of neighbouring sounds.

6.0 TUTOR-MARKED ASSIGNMENT

i. What are phonological processes?
ii. List the various phonological processes and explain only five with copious examples.
iii. What are the functions of these processes in language development?

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UNIT 6 MINIMAL PAIRS

CONTENTS

1.0 INTRODUCTION

Minimal pairs are an important means of establishing the distinctive nature of a phoneme in English. Until a phonetic form passes the test of its being compared to a contextual form in which it is not replaceable by another phoneme, it cannot be placed in a distinct class of independent sound. The meaning content can also not be established. It is seen more as a mere phoneme, a mere sound made but with no particular meaning being distinctly conveyed by it. This unit will therefore show you how to establish the distinct form of a sound through the use of minimal pairs. It will also discuss the instruments for distinguishing phonetic elements. It is also going to show the distinct nature of phones, phonemes, and allophones to avoid confusing them. This unit will also give examples of minimal pairs in the segmental and suprasegmental forms.

2.0 OBJECTIVES

At the end of the unit, you should be able to:

- discuss the nature of minimal pairs;
- identify types of minimal pairs;
- state the instruments for establishing minimal pairs;

- discuss the different aspects of phonetics that contribute to establishing minimal pair types;
- give examples of segmental minimal pairs; and
- give examples of suprasegmental minimal pairs.

3.0 MAIN CONTENT

3.1 Minimal Pairs

Minimal pairs are representative of elements of speech, which have difference only in one segment of their make-up. What this means is that just one sound segment being changed can cause a difference to the word in terms of its meaning and possibly status. Also, the change in the syllable stressed in some English words can lead to a change in their class and function. You may of course, find this comparable in the Yoruba tonal structure, at the semantic level. In the Yoruba tonal structure as is common with many Nigerian indigenous languages, the placement of the tonal mark has implication for the pronunciation of the word and also its semantic content. As such, a word like [agbon] will have different meaning due to change in the direction of the pitch of voice. As such,

1. Àgbon (coconut)
2. Agbòn (basket)
3. Àgbòn (jaw)
4. Agbón (wasp)

are only different on the basis of tonal placement on the word. This affects what they mean even though they are spelt the same way. Naturally, their having different tone position leads to different pronunciation. The four examples above clearly indicate that tone is phonemic in the Yoruba language. This could be found to be the same in many Nigerian languages. The examples above illustrate the way minimal pairs function as it is obvious that what makes a difference in the words is just the movement of the tone from one point to the other.

Nonetheless, the best language to illustrate this functioning of minimal pairs appears to be English. Examples of minimal pairs in English could be seen below. For instance, the difference between [bit] and [pit] is just the sound segment [b] and [p]. It is obvious then that minimal pairs clearly make a difference in the meaning that words have. The essential concept is that when a segment is replaced it changes the meaning of the word as we see in the words *pit* and *bit*. The change in the initial segment thus changes the meaning of the words. This makes it easy to establish that these two sounds are different sounds. This essentially is what minimal pairs are used to do in the phonology of the English

language. In this way, it establishes the difference in two segments or suprasemental elements. Minimal pairs are then possible tools that can be used to establish phonemic status of sounds and other speech elements.

SELF-ASSESSMENT EXERCISE

Discuss, with 10 examples from your language, some words or phrases in which tone is phonologically significant.

3.2 Types of Minimal Pairs

Minimal pairs can occur at the segmental sound level and the level of the suprasegmentals, especially that of stress. As the examples above have illustrated, minimal pairs are not the exclusive preserve of segmental elements in English. Stress placement can have implication for the meaning and the pronunciation of a word. For example, a word like *import* can have two different meanings due to the position its stress occupies in the word. As it is obvious, the word has two syllables [im.port]. The syllable division is done with the dot within the word in the square bracket to divide it into two syllables. When the stress is placed on the first syllable, the word is pronounced with the first vowel having full realisation. But when the stress shifts to the second syllable, the second vowel now has full realisation while the first one becomes unstressed.

In addition, the class of the word changes due to the stress positioning. What this means is that the first realisation of the word with the stressed syllable being the first one makes the word realised as a noun. However, when the stress shifts position to the second syllable, it is realised as a verb. This shows that stress is also phonemic in the English language. The question then is what are these phonemic elements that enable us to establish the phonemic status of the phonetic elements in English?

SELF-ASSESSMENT EXERCISE 2

State two types of minimal pairs that you are familiar with

3.3 Phonetic Base for Minimal Pairs

The phonetic base for minimal pairs can be found in the phonetic elements that help us to determine the nature of a sound. In phonology, there are not just sounds, but the function it performs is important in establishing its nature. This is why we continue to say that phonology is about the functioning of sounds in language. The terms phone, phoneme and allophone are different based on their nature and the functions they

perform in language. We will thus discuss these terms to establish what they are and how they contribute to minimal pairs functioning in the English language. Let us look therefore closely at the terms: phone, phoneme and allophone.

3.3.1 Phone

When we talk of a phone, we are referring to the sound elements made within a language. When we make sounds, we are merely producing phonic entities. Thus, in producing [p, t, k, l, r, e, ʤ, ʃ, ɑ, etc.], we are merely making sounds. (Note: the square brackets are used to indicate phones while the slanting brackets indicate the sounds have been established as phonemes.) But to establish them as being significant will require another test. And this is where minimal pairs become a useful tool in establishing the significance of any phone. When it becomes significant, it is referred to as phoneme.

3.3.2 Phoneme

A phoneme is a sound segment that has been found to possess significance in terms of its existence and meaningfulness within a language. Thus, to establish a phone as being an actual phoneme requires putting it in the environment of other sounds in order to see if it can function.

Thus, by putting [p] in the environment of segments like [-it] to form pit, we see that it can combine with other sounds to form a meaningful word. But to establish its being an independent phoneme in contrast to some other phonemes now requires its sharing this environment with them. Thus, we may replace /p/ with [k] in the environment of /-it/ in other to create kit. In this way, we are able to establish that /k/ is different from /p/ in that they can both occur within the same environment. This is the convention that is called minimal pair. That is the pairing of sound segments at minimal levels to establish their independent forms.

3.3.3 Allophone

Allophones are usually variants of the same phoneme. Unlike in the case of different phonemes, these cannot occur in the same environment. They are usually mutually exclusive. And the reason for their occurrences is more often phonological. When a single phoneme is realised in different environments by a series of phonemes, we say the different occurrences are the allophonic variations of the same phoneme. What this means is that a phoneme gets realised in a particular manner in a particular environment. This particular manner of being realised is a

peculiar way of being realised by this phoneme in this sort of environment. The phoneme may not get realised in this particular manner in another environment.

We may take, for instance, the sound /t/. This sound can get greatly influenced by different situations around it. This phoneme is what is regarded as the phonetic representation or underlying representation of the phoneme. The alternative realisations are that /t/ becomes aspirated in the stressed syllable initial position. This allophonic realisation of /t/ is written as [t^h].

/t/ also gets nasalised when followed by a homorganic nasal. That is, when followed by /n/, which is also an alveolar sound like /t/, sound /t/ begins to anticipate the pronunciation of the following /n/ sound and thus releases its air stream partly through the nose. We write it as [t^N].

/t/ also becomes lateralised when followed by a homorganic lateral. That is, the alveolar lateral /l/ following /t/ in a word like bottle /bɔt^Ll/ gets anticipated in the course of finishing the production of /t/ in the word above. Thus, /t/ gets finished in producing /l/

We can thus see four possible realisations of /t/. It may be just the voiceless alveolar plosive as in bat or cat. It may be realised with aspiration as in tape or nasalised as in cotton or lateralised as in kettle. These four realisations occurred in different environments and they are therefore referred to as allophonic variants of the same phoneme.

We however note that they cannot be regarded as different phonemes because the sound underlying the representations can still occur in the same environment in a minimal pair. Thus,

tape – take, bat – bet, etc.

Self Assessment Exercise 3
Using any segment as example, fully discuss the allophonic variations that are possible with your chosen sound.

3.4 Examples of Minimal Pairs

3.4.1 The Sound Segments

/i:/	/ɪ/	/v/	/f/
feel	fill	van	fan
wheel	will	vale	fail
seat	sit	vain	fain
feet	fit	viewer	fewer
leak	lick	veer	fear

/æ/	/ɑ:/	/z/	/s/
bad	bard	zeal	seal
pack	park	lose	loose
had	hard	house(v)	house(n)
mad	marred	this	these
ban	barn	buzz	bus

/e/	/ʌ/	/ʃ/	/ʧ/
bed	bud	sheep	cheap
said	sud	cash	catch
bet	but	she’s	cheese

/ə:/	/ɑ:/	/l/	/r/
fur	far	lack	rack
bird	bard	Blake	brake
burn	barn	load	road

/ʌ/	/ə:/	/s/	/ʃ/
bud	bird	sot	shot
puss	purse	soot	shoot
such	search	said	shed

/ɔ/	/ɔ:/	/b/	/p/
cot	caught	bill	pill
rot	wrought	bin	pin
cod	cord	Ben	pen
don	dawn	rib	rip

/u/	/u:/	/d/	/t/
full	fool	deem	team
soot	suit	din	tin
wood	wooed	dry	try

/ʌ/	/ɔ/	/g/	/k/
done	don	gap	cap
stuck	stock	lag	lack
putt	pot	rag	rack
shut	shot	graze	craze

/e/	/ei/	/θ/	/t/
debt	date	thick	tick
get	gate	bath	bat
red	raid	wreath	writ
wedge	wage	three	tree

/ɔ:/	/əu/	/ð/	/θ/
born	bone	thy	thigh
court	coat	wreathes	wreaths
walk	woke	teethe	teeth
porch	poach	mouth (v)	mouth (n)

/əu/	/ɑu/	/d/	/ð/
tone	town	den	then
boat	bout	Dan	than
drone	drown	breed	breathe
wrote	rout	ladder	lather

/ɔi/	/ɑi/	/w/	/v/
boy	buy	went	vent
oil	aisle	wail	vale
boil	bile	wane	vain

/l/	/j/	/z/	/ð/
loo	ewe	breeze	breathe
lose	use	rise	writhe
lawn	yawn	seize	seethe

/z/	/ʒ/	/ʒ/	/ʃ/
composer	composure	rouge	ruche
Caesar	seizure	genre	shone
bays	beige	allusion	Aleutian

/m/	/n/	/ŋ/	/n/
maim	name	thing	thin
dame	Dane	singer	sinner

/h/	/w/	/g/	/ŋ/
horse	worse	bag	bang
who	woo	sag	sang
hate	wait	hag	hang

/h/	/ - /
heat	eat
hill	ill
heel	eel

SELF-ASSESSMENT EXERCISE 4

Give examples of ten sounds and the possible minimal pairs of the sounds.

3.4.2 Stress as a Phonemically Significant Element

The position in which the stress is placed in this group of words is phonemic. That is, it is significant in terms of its function and meaning. Such words are usually spelled or written orthographically in exactly the same manner. However, as we are well aware by now from all our previous discussions, a stressed syllable has its nucleus fully realised whereas a non-stressed syllable will be realised as the weak form. Thus, the position of the stress in these words affects the pronunciation of certain syllables. While a syllable that has a full-vowel realisation has one pronunciation of the word, the other may have the weak form realised due to the shift of the tonal mark in another.

Examples are:

Noun/Adjective	Verb
ˈpermit /ˈpəːmit/	perˈmit
ˈperfect /ˈpə: fikt/	perˈfect /pəˈfekt/
ˈcombine /ˈkɔmbɑin/	comˈbine /kəmˈbɑin/
ˈpresent /ˈpreznt/	preˈsent /priˈzent/

You should try and get other examples of your own.

SELF-ASSESSMENT EXERCISE
Give about 10 examples of words that have stress significance in their usage and demonstrate how they operate.

4.0 CONCLUSION

In this unit, you learnt about minimal pairs. We have seen that minimal pairs are very important in establishing the significance of a phone for it to become a phoneme. We have also seen that allophones are mere variants of the same phoneme as opposed to how minimal pairs help us to establish individual phonemes through the means of substitution. It is thus obvious that minimal pair is an important device in establishing independent phonemes/sounds of English. The copious examples given reveal this.

5.0 SUMMARY

This unit discusses minimal pairs. It specifically defines what minimal pair is and how it functions. It outlines different types of minimal pairs possible in the English language as segmental and suprasegmental. It also establishes the way phonetics functions as the base for the phonological establishment of minimal pairs. It gives copious examples

of segmental and suprasegmental minimal pairs that are possible in English language.

6.0 TUTOR- MARKED ASSIGNMENT

i. Discuss what you understand by minimal pairs in English.
ii. State clearly two points in phonetics at which minimal pairs can be applied.
iii. Identify three phonetic points that form basis for minimal pairs operation in the English language.
iv. Give 10 different examples of segmental sounds and two possible minimal pairs formed with each.
v. Give 15 examples of minimal pairs formed with the suprasegmental element of stress in English sentences.

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