Introductory Phonetics and Phonology of English

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To the memory of
Prof. M. A. Amayo

and

all my students that made the teaching of oral English, at one time or the other, a challenging and interesting task.

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ACKNOWLEDGEMENTS

I wish to acknowledge, first and foremost, God who gave the wisdom and the strength to write this book.

I must also thank my students, past and present, for their incessant long faces as one tries to unravel for them the 'mystery' of the phonetics of English. Moreover, their laughter at the strange and funny sounds they have to learn to pronounce. It had been a source of inspiration.

Can I forget the different authors whose works had been so helpful in fulfilling this dream? They are duly acknowledged in the bibliography. Specifically, I must express my profound gratitude to Professor Alan Cruttenden, who willingly gave his go ahead to use some graphics from his book. Peradventure, there is any omission in the acknowledgement of any author, it is surely not deliberate; I would be glad to correct such as soon as it is brought to my notice.

What can I say of my numerous teachers that had, at one time or the other, imparted their own bits of knowledge in the field? It is to say thank you. Special mention however needs to be made of late Prof. M. A. Amayo for a short but profound contact (1995/96 M. A. language class), which was most stimulating to my interest in phonology. The memory remains evergreen.

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In the same vein, I wish to express my profound thanks to the team of scholars at Cambridge Scholars Publishers who found enough merit in this work to publish it. I believe, our association will be mutually beneficial in the long run.

My colleagues in the Department of English, Federal College of Education, Okene, where the book was first published and made public, were very encouraging through their cooperation and helpful propagation of the

book. My new colleagues within and outside the Department of English, National Open University of Nigeria, Lagos have also been very supportive through their heartening comments and helpful suggestions on the first edition of the book. Their suggestions had been taken to heart in the course of this revision of the book.

I am most grateful to my husband, Femi, who had to bear with long spells of my lack of attention in the course of writing this book. Your understanding and subtle encouragement have been of tremendous value to me.

—I. Omolara Daniel, PhD
NOUN, Lagos.
2010

PREFACE

This book was conceived as an introductory course meant to help students familiarise themselves with the basics of the English phonetics and phonology. Even though it appears a bit heavy on theories, a lot of practical guide was provided in terms of examples with which to practice and illustrate the concepts presented in the book.

The terror that the pronunciation of English holds for the average Nigerian learner of English is palpable. This problem is compounded by the manner in which many class teachers of English make it a point of duty to avoid teaching the orals of English in their classes. This is despite the fact that the school curriculum for English, right from the primary school to the certificate class in the secondary school, makes provision for its study. It had been suggested that these teachers themselves had been badly trained (cf. Vincent, 1979), or probably they too badly learned or they are just simply poor models of the spoken English. Whatever reasons may be adduced, the student/learner is the worse for it.

This book therefore attempts to give a practical guide to the learner in all ramifications of theoretical and practical uses of the phonetics and phonology of the English language. Useful suggestions and tips were also given on how to do it yourself to overcome the terror of the sounds of English. An attempt was also made to give detailed information on the workings of the prosodic features of English, referred to as the suprasegmentals. This was especially necessary, as they remain, largely, the most confounding aspect of the English language to the average Nigerian speaker of English. We must, of course, acknowledge the nature of the English language itself is part of the overall problem with studying or speaking it.

We also dwelt on the distinctive phonological features of English to help make the identification and description of the sounds of English even more interesting and accessible. The discussion on the phonological tendencies of the sounds of the English language is also meant to help the reader see the English sounds as functional entities that go beyond the theoretical descriptions of their articulatory processes in the classroom.

The hope one has is that this piece of writing will be able to help you, not only to pass your examinations, certificate or internal, but also make you a better and more confident speaker of the English language. It is also hoped that this work will spur you to delve into the interesting world of phonetic and phonological study of languages around you.

Happy reading.

—I. O. Daniel

CHAPTER ONE

GENERAL INTRODUCTION

1.1 Phonetics and Phonology – definition and distinction

1.1.1 Phonetics

Phonetics is a scientific description of what speech sounds exist in a language. It represents how they are produced and perceived and what acoustic properties they have. Thus, it can be put in the class of natural sciences. Phonetics essentially seeks to trace the processes physiologically involved in sound production. It describes the ways the sounds are produced and the points at which they are articulated.

1.1.2 Phonology

Phonology is concerned with the regularities that govern the phonetic realisations of sounds in words of a language. It looks at and tries to establish a system of sound distinctions relevant to a particular language. It then seeks to determine how the elements of this abstract system behave in actual speech. Phonology actually delineates the functioning of sounds in particular contexts.

1.1.3 The Distinction

From the above, it is obvious that phonology is not phonetics, neither is phonetics phonology. They are however both subject to descriptive details if proper instrument of analysis is applied. The question then is: what is the difference?

From the definitions above, the difference should be somewhat obvious. We have said that phonetics describes the physical realisation of sounds. It studies the physiological processes involved in sound production. Phonology on the other hand looks at the behavioural patterns of sounds in actual speech, their realisations in different environments, whatsoever these may be.

Phonetics is thus concerned with sound production while phonology studies sound behaviour in realisation. Adeyanju (2003) expatiates on the difference. This is in terms of phonetics being concerned with providing the set of features which can describe the sounds of a language while phonology provides the information that has to do with the functional patterning of the sounds in the language. He thus views phonetics as providing the raw materials for the description of the speech sounds production while phonology is about the organisation of the sound patterns in the language. Essentially then, we could safely say that phonetics describes the production process involved in physical sounds while phonology describes the environmental factors that shape these sounds in particular points of occurrence.

To show this difference, let us look at the sound /t/.

/t/ is phonetically described as a **pulmonic egressive voiceless alveolar plosive**. What this means is that the air stream coming out from the lungs initiated the sound. The vocal folds did not vibrate in the course of its production. The blade of the tongue had contact with the teeth ridge (the alveolar). This contact created a total obstruction of the air stream coming from the lungs. This air stream was suddenly released, thus creating an 'explosion'. These are the phonetic characteristics of the sound. We will talk more about these later.

However, the environment in which this sound occurs in the course of its production will influence the phonological description. These environments are usually sounds, other sounds, that is, or the position of the sound in relation to other sounds.

Thus, phonologically, /t/ can be realised with aspiration in the initial position of a stressed syllable; that is, when /t/ comes before other sounds in a stressed syllable. It can be realised as being lateralised when immediately followed by the lateral /l/. It can also become nasalised if its closest succeeding neighbour is a nasal, especially the alveolar nasal /n/, which is actually a homorganic sound.

Thus, we see the phoneme /t/ realised phonologically as

/t^{h}/ in *tape*
/t^{L}/ in *kettle*
/t^{N}/ in *kitten*
/t^{o}/ in other positions as in *Kate*

Another example is /l/. /l/ is a lateral sound released after a partial obstruction between the blade of the tongue and the alveolar. It is voiced. Phonologically, this sound can become velarised before velar sounds and when it occurs in the final position in words. It becomes devoiced when it follows voiceless sounds. It becomes syllabic when

it follows homorganic sounds. It however retains its normal form in the initial position. There has also been a suggestion that it becomes palatalised in medial position when preceded and followed by the vowel /i/.

Thus, /l/ can be realised phonologically in different positions as:

/ɬ/ as in *milk, fill*
/lʲ/ as in *million*
/l̩/ as in *saddle, kettle*
/l̪/ as in *play, slaughter*
/l/ in all other positions as in *lace*

You may find more examples on your own to show these phonological differences.

What we are saying in the long run is that the voiceless alveolar plosive /t/ does not change its phonetic characteristics but may have additional characteristics by virtue of the phonological influence of its position of occurrence. The same goes for the alveolar lateral /l/.

Practice Questions

A. State one major way in which you can differentiate phonetics from phonology or vice versa.
B. Give the definitions of the following: (a) phonetics
(b) phonology
C. Using /p/ and /b/ as cases in point, discuss the phonetic and phonological characteristics of these sounds.

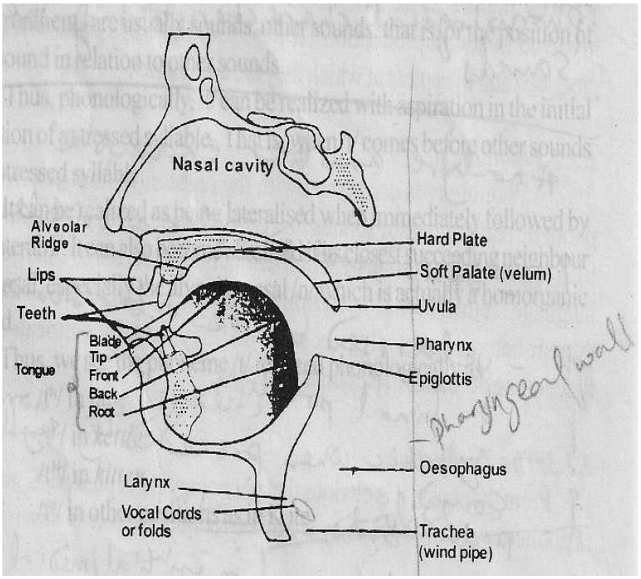
CHAPTER TWO

THE MECHANISM OF SPEECH SOUNDS

2.1 Organs of Speech

The organs situated in the respiratory tract had been adapted by humans for speech production. Thus, from the lungs to the lips and the nose, the organs along this path are normally adapted for speech production. This is graphically presented below in Figure 1.

Figure 1. Organs of Speech



The diagram shows the major human organs in the vocal tract involved in speech production.

2.2 The Air Stream Mechanism

The most usual source of energy for speech production is the air stream expelled from the lungs. This is called the **pulmonic egressive air stream**. The term, pulmonic, has to do with the lungs. Egressive has to do with the fact that it is coming out. The opposite of this is ingressive, that is, being sucked in. Air stream may be regarded as a continuum of release of air. It is called mechanism because it is a process of air stream release that works together to form sounds. The English language normally makes use of the pulmonic egressive air stream mechanism for the production of its sounds.

However, it should be noted that some languages possess sounds not requiring lung or pulmonic air for their articulation. These include such airstream mechanisms as the **glottalic** and **velaric** types. The glottalic airstream mechanism is initiated at the **laryngeal cavity** and is usually used to produce **implosives** and **ejectives**. The velaric airstream mechanism is initiated at the **tongue** and is usually the source of the production of **clicks**. It should, nevertheless, be noted that these last two airstream mechanisms are not very relevant to the production of English sounds. Nonetheless, Gimson and Ramsaran (1989:9) note that English also has one or two **extralinguistic** sounds; that is, sounds that are not really regarded as language. Examples given in the work include the sound usually written as *tut-tut* and the sound of encouragement made to horses. One may also add that the sound we normally make when we suck in our breath in pain and the sound we make to call dogs (at least, in the western part of the River Niger in Nigeria) are in this category. These sounds are made without the aid of the lungs. One could actually refer to them as ingressive airstream types, but non-pulmonic. Our concern though is with the pulmonic airstream mechanism. So, the process of the English sound production is presented in section 2.3 below.

2.3 The Speech Chain

The air provided by the lungs undergoes important modifications in the upper stages of the respiratory tract before it acquires the quality of a speech sound. The different stages involved in the process of speech production from the initiation to that of its full realisation is referred to as **speech chain**. As mentioned above, English sounds generally make use of the air initiated from the lungs.

The air stream coming from the lungs first of all comes up through the **trachea**, that is, the windpipe. It then passes through the **larynx**. The

larynx is a casing, formed of **cartilage** and **muscles**. It is situated in the upper part of the trachea (windpipe). Its forward portion, which is more prominent, is commonly referred to as 'Adam's apple'. Housed within this structure, from rear to front, are the **vocal folds**. The two folds are made up of **ligament** and **elastic tissue**. The folds may be brought together or parted by rotation of the **arytenoids cartilages**, which are attached at the posterior end of the folds, through muscular action. The opening between the folds has the biological function of helping to prevent foreign bodies from entering into the trachea and the lungs.

The diagram of the pulmonic air stream movement is shown in figure 2 below. The diagram shows the air stream directionally moving upwards out of the lungs. The arrows reveal the direction of the air stream as it comes outwards from the lungs towards the larynx.

Figure 2. The Pulmonic Egressive Air Stream Mechanism

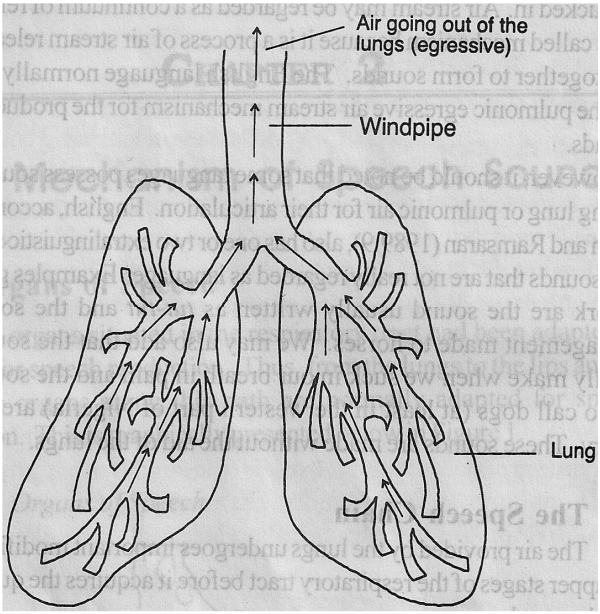


Fig. 2 graphically shows the air direction out of the lungs.

2.4 The States of the Glottis

We have already described the nature of the **glottis** in the preceding section. This is usually formed by the action of the vocal folds. Whatever shape the vocal folds may assume at a particular time is the state of the glottis.

2.4.1 The Three States of the Glottis

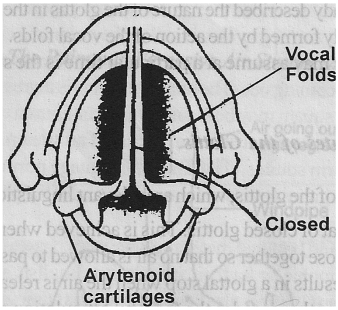
There are three states of the glottis, which are relevant linguistically.

1. The first is that of **closed glottis**. This is achieved when the folds are brought close together so that no air is allowed to pass between them. This results in a glottal stop when the air is released. This stop /ʔ/ frequently precedes the forceful articulation of vowels, e.g. [ʔaut, ʔi:t] *out, eat.* It may even replace the English stop /t/ in words like *football, bottle, bit,* etc. It may also reinforce or replace such other plosives like /p, k/.
2. The glottis may be held **open** for normal breathing. It is also this state that produces the **voiceless sounds** of English. Examples of these are /t, p, k, f, s, ʃ, ʧ, h/. The vocal folds are spread and do not vibrate. The glottis is sufficiently wide open to allow the air stream to pass through without obstruction or vibration of the vocal folds.
3. The third state of the glottis is that of the **narrow glottis** or vocal folds loosely held together. In this state, the vocal folds vibrate to produce **voice**, otherwise called **phonation**. This vibration of the larynx may be felt by laying a finger on or just above the Adam's apple. This bony structure houses the larynx. All vowels, nasals, glides and laterals are voiced.

   You can compare the dual phonemes /f-v, p-b, t-d, k-ɡ, s-z, ʃ-ʒ, ʧ-ʤ/ to differentiate their phonation status, whether voiceless or voiced. This is the only thing differentiating these pairs of sounds that would have been otherwise similar. The first of the pairs are voiceless sounds while the second segments of the pairs have voiced sounds.

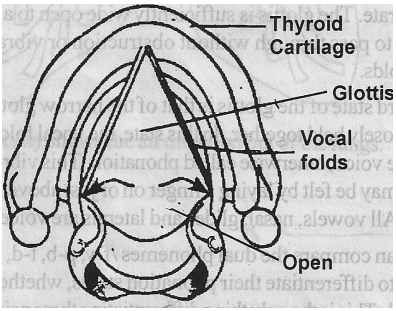
Figure 3. The Three States of the Glottis

State 1.



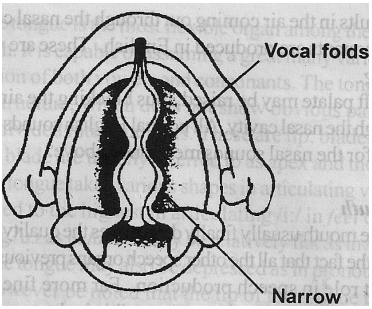
Vocal folds tightly held together as for the glottal stop /ʔ/.

State 2.



Vocal folds held open as for normal breathing and voiceless sounds.

State 3.



The vocal folds are loosely held together to form a narrow glottis, which causes vibration as the air passes through. This results in the production of voice in sounds.

(Adapted from Cruttenden, 1994)

- *These are the graphic representations of the three states of the glottis.*

2.5 The Resonating Cavities

Once the air stream leaves the larynx, it is further modified in the upper regions of the **vocal tract**. The shape assumed by the pharynx, the velum (soft palate) and the mouth have great implications for sound production. These organs are therefore called **resonators**.

The **pharyngeal cavity** extends from the top of the larynx and the oesophagus, beyond the epiglottis and the root of the tongue, to the region in the rear of the soft palate.

The **velum** or **soft palate** may be lowered to allow the air escape through the nose and the mouth. This produces nasalised sounds as in /d^{N}/ of *sudden* and the nasalised vowels. Many of these **nasalised vowels** exist in the Yoruba language e.g. /õ/ as in ọ̀*kan*, /ĩ/ ẹ̀*yin* etc.

The soft palate may be lowered so that the air passes through the nose, but with a complete obstruction at some point in the mouth. This obstruction results in the air coming out through the **nasal cavity**. This is how nasal consonants are produced in English. These are /m, n, ŋ/ as in *ram, ran, rang*.

The soft palate may be raised, thus blocking the air stream from escaping through the nasal cavity. All normal English sounds have this oral escape, except for the nasal sounds mentioned above.

Figure 4. Final Stages of the Pulmonic Egressive Airstream Mechanism

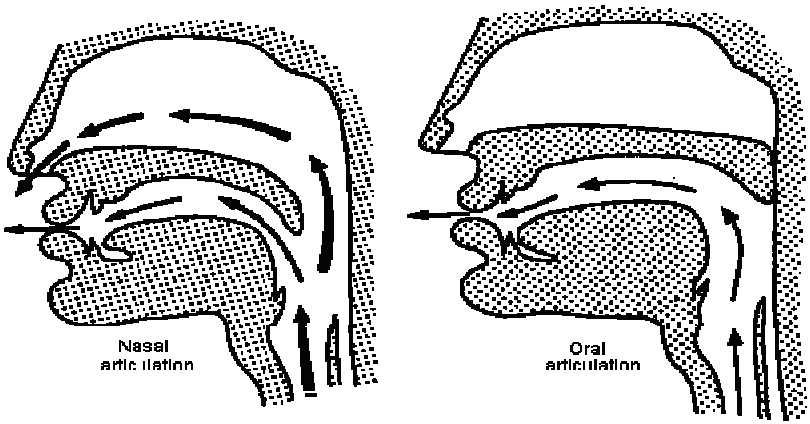


Fig. 4 shows the nasal and oral release of the airstream from the lungs to show the articulation of oral, nasal, and nasalised sounds.

2.5.1 The Mouth

The shape of the mouth usually finally determines the quality of our speech sounds despite the fact that all the other speech organs previously mentioned play important roles in speech production. Far more finely controlled variations of shape and realisations are possible in the mouth than in any other part of the speech mechanism.

The only points which may be regarded as being relatively fixed in the mouth are the **upper teeth**, the **alveolar ridge**, the **hard palate** and the **pharyngeal wall**. You may go back to the diagram of organs of speech to locate these different points in the mouth.

The other organs in the mouth are movable: the lips, the various parts of the tongue and the soft palate, with the **uvula** hanging from it. The lower jaw is also capable of a great deal of movement; its movement controls the gap between the lower and the upper teeth and the position of the lips. The lower jaw has a great influence on the variations in the shapes of the mouth in speech production.

The alveolar ridge is the **teeth ridge**. It can be felt behind the teeth. You should try using your tongue to touch your teeth ridge just behind your front upper teeth. The **hard palate** is the bony arch at the roof of the mouth. The soft palate, which is also called the velum, is immediately behind the hard palate, towards the rear of the mouth. You can use the tip

of your tongue to touch all these parts mentioned above to locate them. But better still, you should take a mirror to look at the points mentioned, which are located in the upper part of your mouth, as you touch them with your tongue.

The lips constitute the **final orifice** of the mouth in an **oral articulation**. Their shape usually affects the total cavity. They may be shut tightly or held loosely or rounded. If they are shut totally, they form a complete obstruction of the air stream. The air stream is held back momentarily before being released suddenly as in the production of bilabial stops /p/ and /b/ in *pat* and *bat* or it is allowed to pass through the nose as in the production of the bilabial nasal /m/ in *mat*.

The **tongue** is the most flexible organ among the movable organs of the mouth. It is capable of assuming a great many varieties of positions of articulation of both **vowels** and **consonants**. The tongue is a complex muscular structure, which does not show obvious parts but had been arbitrarily divided into four parts. These are **tip**, **blade**, **front**, and **back**. The tip and blade are usually referred to as **apex** and the edges as **rims**.

The tongue takes various shapes in articulating vowels. The front may be raised to the highest point in articulating /i:/ in *feel* or the back similarly raised for pronouncing /u:/ as in *fool* or the tongue may be relatively flat as in /*a*:/ to produce *far*. The middle of the tongue may also be depressed as in the pronunciation of /ə:/ in *fir*. It should, however, be noted that the tip of the tongue usually remains behind the front lower teeth in articulating vowels. It maintains this resting position in the articulation of all vowel types in English. You may experiment this and write your findings to the author.

The various parts of the tongue may also come in contact with the roof of the mouth. Thus, the tip, blade, and rims may articulate with the teeth to produce /θ/ and /ð/, sounds normally written as *th*, or with the upper alveolar ridge as in /t, d, s, n, z/. The tip and the blade (the apex) alone may make contact with the alveolar to produce /l/, with the rims providing an escape route for the air stream. There may also be an intermittent contact of the apex of the tongue with the alveolar to articulate a **rolled** /r/.

The front of the tongue may articulate against or near to the hard palate. This will produce the phonemes /ʃ/ and /ʒ/ as in *she* and *vision*. This raising of the front of the tongue towards the hard palate normally results in **palatalisation**. However, this articulatory form is the main feature of the production process of the **palatal** sound /j/ as we have it in *yam*.

The back of the tongue can form a total obstruction of the air steam by its contact with the soft palate (velum) when raised as in the case of /k/ in *card* and /ɡ/ in *guard*. However, the soft palate gets lowered in order to produce the **velar nasal** /ŋ/ as in *bring*.

Practice Questions

A. Draw a diagram to show the process and organs involved in the production of speech.
B. Discuss the three possible states the glottis can have.
C. Describe five possible points in the mouth at which sounds can be produced and two possible sounds at such points.
D. Name the most flexible and mobile organ in the mouth. State three of such movements that made you name it as such.