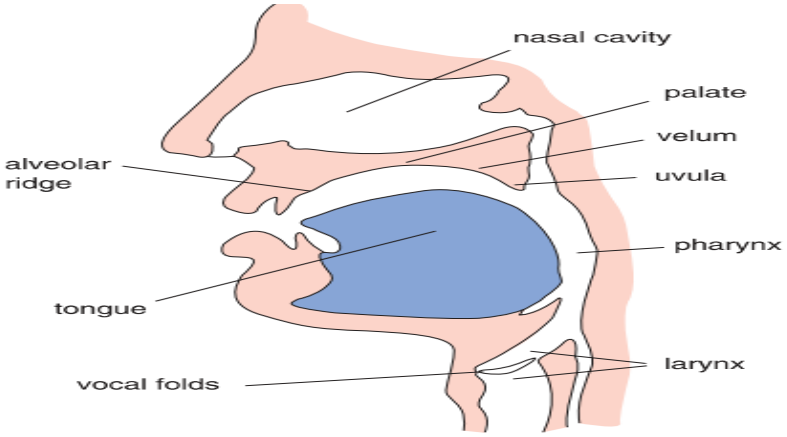

Figure 4. The Articulatory System. From *The Study of Language* (p. 30) .by Yule, G. (2020). Cambridge: Cambridge University Press.

A closer look at the vocal apparatus in figure 4, it appears that many organs interact with each other to produce meaningful speech sounds. For instance, in producing the consonant /**m**/ and /**b**/, one can easily notice the lower lip, fixed in the lower jaw, moving upwardly to form a firm closure with the upper lip. After the two lips are tightly hold together for a few milliseconds, they move apart from each other. The obstruction is, then, followed by a quick release of the airstream outside the mouth. The production of the semi-vowel /**w**/ involves a narrowness of the speech organs at two levels, mainly the lips and between the velum and the back part of the tongue.

PHONATION

Lesson 8: Phonatory System

INSTRUCTIONAL OBJECTIVES

After studying this course, students will be able to:

- Understand the basic mechanisms of the Phonatory system
- Identify the structure of the larynx and its essential functions

Introduction:

Phoneticians concur that speech vocal sounds are made by modifying the airflow at various *points* and in various *ways* in the whole articulatory system (Carr, 2013). One of those points is the **Larynx**, or the *voice box*, as it usually called by laypeople. This course considers the meaning of Phonatory system and casts light over the anatomy of the larynx and its basic functions (see Figure 5 below)

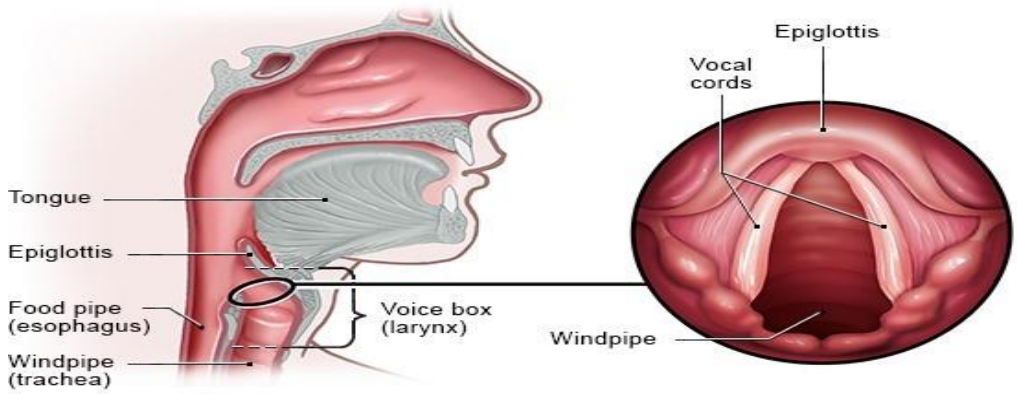

Figure 5. ***The Larynx and Vocal Cords (Anatomy)*****. From** https://www.informedhealth.org/how-does-the-larynx-work.html

Phonation and the Anatomy of the Larynx:

Crystal (2008) notes that **Phonation** refers to the vocal activities produced by the modification of the airstream in the larynx. By vocal activities, he means the set of voices (e.g., breathy voice) and audible sounds caused by the low and high vibrations inside the larynx. Yet, that the larynx is one of the most significant organs involved in speech production is crystal clear. It is a box-like structure made of cartilages and is located in the interior side of your neck. Commonly labeled as *Adam's Apple*, the larynx is, comparatively, more visible in the case of adult men than most women. Figure 6 below represents a simplified picture of the larynx and some of its basic aspects. The **Epiglottis** is a fleshy flap, whose main job is to close off the entrance to the trachea and to prevent the food from moving to the lungs (Collins & Mees, 2013). The food, then, moves to the stomach through the so called **Oesphagus**.

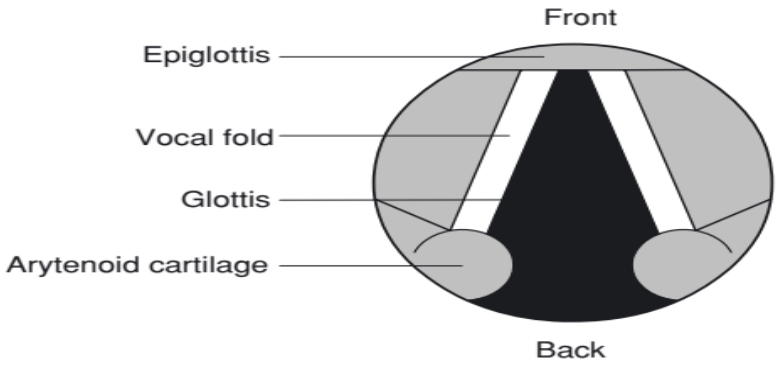

Figure 6. A simplified Model of the Larynx. From Practical Phonetics and Phonology (p. 32), Collins, B. & Mees., I. M.(2003). London: Routledge.

The cross-section model above displays two pear-shaped cartilages called the **Arytenoid Cartilages**. These two cartilages are attached to muscles from one side and to the **Vocal Folds (**or **Vocal Cords)** from another side. The latters are two fleshy tissues that vibrate on varying degrees to produce voices. Compared to

females, Males' vocal cords are comparatively thick. This explains the *tough* and *heavy* voice produced by men, as opposed to women whose voices sound *soft*. The space (in black color) that you see between the cords in the figure 6 is called the **Glottis**. When the vocal cords move apart, the airflow can pass from your lungs through the same space to the trachea and then escapes through your mouth. In a nut shell, the larynx's functions are twofold. First, it has a *Protective function*, whereby the **Epiglottis** acts as a valve that opens up and closes off to protect your lungs from any substance or object. Second, it has a *Phonatory function* in that it modifies the airflow in various ways to produce voices, such as creaky voice and breathy voice.

Lesson 9: Larynx and Voicing

INSTRUCTIONAL OBJECTIVES

After studying this course, students will be able to:

- The different voices made at the level of the larynx
- The basic characteristics of each voice produced by the vocal folds

Introduction:

In the previous course, we covered a great deal of information about the anatomy and functions of the larynx. We pointed out that the larynx has two main roles, mainly protective and Phonatory, and foregrounded some of the most significant aspects of the larynx's structure, such as the vocal folds and Epiglottis. When the vocal folds **abduct** (open) and **adduct** (close), they cause the larynx to produce an infinite number and diverse types of voices. Said plainly, the vibrations made by the movements of the vocal cords admit of varying possibilities of voice types and registers of voices. This present course will cast light over some of these voices and foregrounds their basic mechanisms.

Voiceless (No voice):

In Producing no voice, the vocal folds are moved apart, vibrating at an extremely low frequency. The abduction of the cords leads the pulmonic airstream to escape through the mouth freely.

Normal Voice:

As the pulmonic airstream passes through the larynx, the Arytenoids pull the vocal folds tightly, causing them to vibrate at a very high speed similar to the hummingbird's wings beats. Collins and Mees (2013) assert that vibrations' frequency of normal voice crisscrosses with sex, noting that the changing vibration "occurs on average 130 times a second for male voices, and 230 times per second for females" (p. 32). This explains why the voice made by males sounds *deep* and *heavy*, as opposed to the *sharp* and *soft* voices made by their female counterparts. Figure 6 below elucidates the models of the Voiceless voice (left model) and Normal voice (right model).

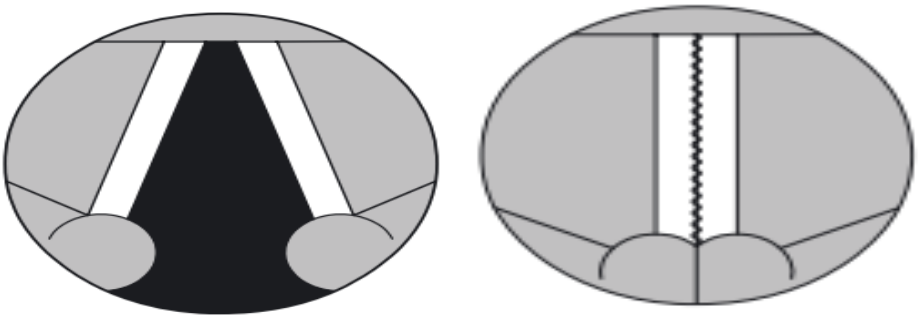

Figure 7. Models of Voiceless Sound and Normal Voice. From Practical Phonetics and Phonology (pp. 32-33), Collins, B. & Mees., I. M.(2003). London: Routledge.

Creaky Voice:

Ashby (2011) notes that when producing a creaky voice, "the vibratory cycles tend to be irregularly spaced in creaky as opposed to regular in normal voice and that the frequency is always very low" (p. 24). That is, the production of creaky voice involves a sequence of vibrations with varying frequencies. In some English speaking communities, this type of voice is highly remarkable in the speech style of women and is commonly called **Vocal Fry (**more information about Vocal Fry can be found in https://www.youtube.com/watch?v=4L7-9N1xQZA**)**. In the USA, the latter is emblematic of prestige and belongingness to higher social classes. It is, also, worth noting that some highly educated speakers in Algeria and France choose to, *intentionally*, adopt this phonation type to index stances, such as 'educated' and 'elitism'.

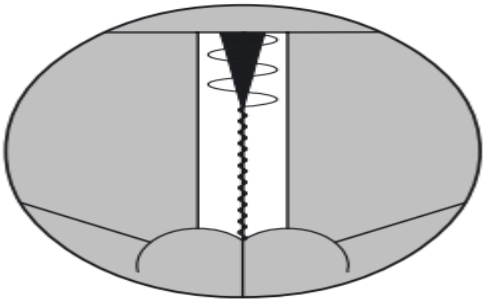

Figure 8. Creaky Voice. From Practical Phonetics and Phonology (p. 35), Collins, B. & Mees., I. M.(2003). London: Routledge.

Breathy Voice:

The production of Breathy voice involves a complete closure of the glottis. However, a small gap is maintained between the Arytenoid, enabling the pulmonic airstream to continuously pass through, as shown in Figure 9. Anyone can produce this phonatory voice in specific situations, especially those in which he/she feels extremely afraid, swims in a swimming pool or holds heavy objects.

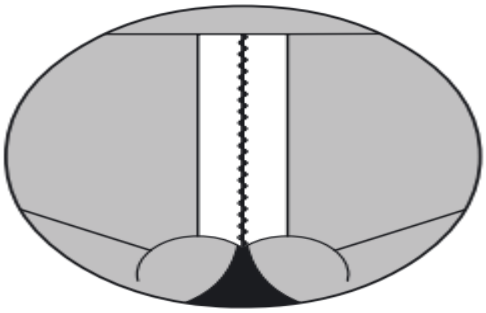

Figure 9. Breathy Voice. From Practical Phonetics and Phonology (p. 36), Collins, B. & Mees., I. M.(2003). London: Routledge.

Other Phonatory Voices:

In essence, the aforementioned voice types represent some of the most widely known voices to laypeople. However, it must be noted, people tend to produce other voices in different situations and cultures. By way of example, **Falsetto**, characteristically a very keen and sharp voice, is mostly made by Opera signers. In addition, many people tend to use a very low voice for various purposes, such as gossiping and disclosing secrets. This voice type is called **Whisper** and it involves holding both vocal cords together with no vibrations (Collins & Mees, 2013).

Lesson 10: Speech Production and Airflow

INSTRUCTIONAL OBJECTIVES

After studying this course, students will be able to:

- Understand the essential processes involved in the movement of the airflow
- Identify the main types of the airflow

Introduction:

The voice coming out of the larynx passes through the Pharynx into two airflow directions. Depending on the position of the **Velum**, the air escapes either through the mouth or through the nose.

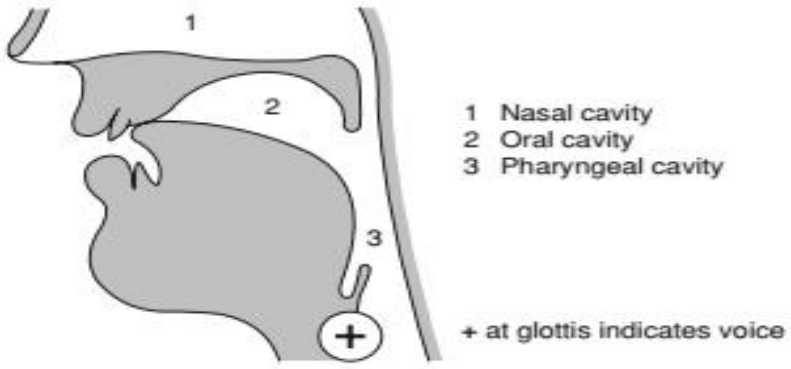

Figure 10. ***Nasal, Oral and Pharyngeal Cavities*****. From Practical Phonetics and Phonology (p. 38), Collins, B. & Mees., I. M.(2003). London: Routledge.**

Oral Airflow:

When the velum (or soft palate) is raised, the passageway to the nose is blocked. This would cause the airstream to escape through mouth. The production of all vowels and most English consonants is accompanied by a flow of the airstream through a channel to the mouth called **Oral Cvity (**see Figure 10**)**. Notice when you utter the sound / **w** / in words like *wave* and *wait*. You can easily feel that the air goes out freely through your mouth.

Nasal Airflow:

In start contrast with the Oral Airflow, Nasal Airflow refers to the channel though which the air escapes through the nose (Ogden, 2009). Phonetically, the velum is lowered, closing off the channel leading up to the mouth, causing the air to go out of the vocal tract through the nose. Unlike the sounds produced with the Oral airflow, there are only three consonants that involve the escape of the airflow through nose, namely /**m**/, /**n**/ and /**ŋ**/. The channel though which the air goes out of the nose is called **Nasal Cavity**.

On Central and Lateral Airflow:

When the Oral airflow escapes through the mouth, it goes down through various passageways in the oral Cavity. The Phonetician Richard Ogden (2009) points out that it is possible to talk of two passageways in the Oral Cavity, namely the **Central Airflow** and **Lateral Airflow.** The former involves the movement of the airflow through the central part of your tongue. Ogden (2009) adds that when you utter the sound / **s** / and then quickly suck the air in, you can easily feel that the air flows on the central part of your tongue. The same is well attested with the sounds /**r**/ and /**w**/. Conversely, the airflow is said to be **Lateral (Airflow Lateral)** when the air escapes through both sides of your tongue. When you pronounce the sound /**l**/ and then suck the air in, you can easily notice the air flowing down through both sides of the tongue.

MONOPHTHONGS, DIPHTHONGS AND TRIPHTHONG

Course 11: Short Vowels and Long Vowels

INSTRUCTIONAL OBJECTIVES:

After studying this course, students will be able to:

- Understand the locus of Vowel and its basic characteristics
- Understand the meaning of monophthongs
- Identify the differences and similarities between short vowels and long vowels

What is meant by a vowel?