



# E-Content

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## UNIT 2 THE DESCRIPTION AND CLASSIFICATION OF CONSONANTS AND VOWELS

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### 2.0 OBJECTIVES

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In this unit, we discuss in detail, the criteria for describing and classifying consonants and vowels. We also understand the concept of monophthong and diphthong.

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### 2.1 DESCRIPTION AND CLASSIFICATION OF CONSONANTS

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#### 2.1.1. Introduction

In Unit 1 we studied in detail the functions of each of the organs of speech that contribute to the production of speech sounds. All these organs were studied under three different systems, i.e. The Respiratory System, the Phonatory System and the Articulatory System. The shapes and positions assumed by each of these organs of speech modify the air passing out from the lungs to meet the air outside, and determine the quality of the sound produced. Thus for the production of different speech sounds the organs of speech take up different positions and assume different shapes.

We saw that the two broad categories of sound - 'vowel' and 'consonant' can be produced with the air passage free (vowels) and with the air passage completely blocked or narrowed so as to cause friction (consonants). We shall now describe consonants in terms of their production. In doing so we shall make use of the information we have on the functions of the organs of speech in Unit I.

### 2.1.2 Criteria for the detailed description and classification of Consonants

### Consonants & Vowels

In order to describe and classify consonants we must provide answers to the following questions.

1. Is the air stream provided by the lungs or by some other organs?
2. Is the air stream forced outward or drawn inward? (egressive or ingressive)
3. Do the vocal cords vibrate or not? (voiced or voiceless)
4. Is the soft palate raised or lowered?
5. At what point/s does the articulation take place?
6. What is the manner of articulation?

1 and 2) As we have already said, most languages of the world use lung air for the production of speech sounds and it is the egressive air stream that they use. Thus the air stream mechanism is **pulmonic egressive**. This is true of all Indian languages except Sindhi, and also of English. In a brief description of the sounds produced in these languages therefore we do not need to ask the first and second questions every time.

- 3) To answer question 3 we need to ascertain whether the vocal cords vibrate in the production of a given sound or not. To ascertain this we need to repeat the experiment we described in Unit 1, that is, put your forefingers into your ears so as to plug them, and produce the given sound. If you can hear a hum during the production of the sound, the vocal cords are vibrating and the sound is **voiced**. If no hum or buzz can be heard then the vocal cords are not vibrating and the sound being produced is **voiceless**.
- 4) If the soft palate is raised to shut off the nasal passage, there is a velic closure, during which only oral sounds can be produced. If the soft palate is lowered, there is no velic closure, and therefore either nasal or nasalised sounds can be produced (see unit one for nasal and nasalised sounds).
- 5) **The point or place of articulation** is determined by the passive articulator. For example, if the front of the tongue (active articulator) is raised towards the hard palate (passive articulator) to make a complete closure or for a narrowing of the air passage, then the place of articulation is the palate, and the sound is a **palatal** sound.
- 6) **The manner of articulation** refers to the kind of closure or narrowing involved in the production of the initial sound in the English word butter, the two lips make a complete closure. The air that is compressed behind the closure is then suddenly released. For the production of the initial sound in the English word soap, there is no closure but only a narrowing caused by the raising of the tip and blade of the tongue towards the teeth ridge. There is thus a difference with regard to the manner of articulation of the two sounds, as also their place of articulation.

### 2.1.3 Place of Articulation

As we have just seen the place of articulation of a consonant is determined by the passive articulator that is involved in its production. It is for this reason that the sound is also named after the passive articulator. For example, the initial consonant in the English word goal, is called a **velar**, because the passive articulator involved in the production is the soft palate or the velum.

Let us consider the main places of articulation of consonants beginning with the front most articulators.

- (a) **Bilabial:** Those consonants in the articulation of which the (upper and lower) lips are involved. For example, the initial sounds in the English words, post, boast, meal, win and the Hindi words फल, पल, बल.
- (b) **Labio-dental:** Those consonants in the production of which the active articulator is the lower lip and the passive articulator is the upper teeth. The initial consonants in the English words fate and vow are labio-dental consonants.
- (c) **Dental** consonants are those in the production of which the active articulator is the tip of the tongue and the passive articulator the upper teeth. Examples of dental consonants are the initial consonants in the English words, thin and these and in the Hindi words, तान, थान, दान, धागा. However, the English consonants in these words differ from the consonants in the Hindi words in respect of the manner of articulation.
- (d) **Alveolar** consonants are produced with the blade of the tongue as the active articulator and the teeth ridge as the passive articulator. For example, the initial consonants in the English words tool, day, lip, nail, sit, zoo, and in the Hindi word सोना.
- (e) **Post-alveolar** consonants are those in the production of which the active articulator is the tip of the tongue, and the passive articulator the rear part of the teeth ridge. For example, the initial consonant of the English word red.
- (f) **Retroflex** consonants are produced with the underside of the tip of the tongue as the active articulator and front of the hard palate as the passive articulator. The tip of the tongue is curled back in such a way that only its underside articulates. For example, the initial sounds in the Hindi words टमाटर, छडा, डर, छिला. English does not have retroflex consonants.
- (g) **Palato-alveolar:** For the production of palato-alveolar consonants (i) the blade of the tongue as the active articulator, articulates against the teeth ridge which is the passive articulator. **At the same time** the front of the tongue (active articulator) is raised towards the hard palate (passive articulator). For example the initial consonants in the English words chop, just, ship, and the sound represented by the spelling sj in the words provision, revision.
- (h) **Palatal** consonants are produced with the front of the tongue as the active articulator and the hard palate as passive articulator. For example, the initial consonant in the English word yard.
- (i) **Velar:** For the production of velar consonants the active articulator, the back of the tongue articulates against the passive articulator, the soft palate. For example, the final consonants in the English words rock, bag, ring and the initial consonants in the Hindi words कड़ी, खड़ी, गली, बड़ी.
- (j) **Uvular:** The active articulator in the production of Uvular consonants is the back of the tongue, and the passive articulator the Uvula. For example, the initial consonants in the Urdu words कलम (pen) and करीब (near). English and Hindi have no Uvular consonants.
- (k) **Pharyngeal:** The active articulator for the production of these consonants is the hindermost part of the tongue and the wall of the Pharynx. An example of a Pharyngeal consonant is the Arabic consonant represented by the spelling h in the word Mohammed. This consonant does not occur in English and most of the Indian languages.

- (l) **Glottal:** The articulators for the glottal sounds are the two cords which move closer resulting in a narrowing of the air passage. For example, the initial consonants in the English word hat and the Hindi word हथ.

Thus we have the main places of articulation to help us describe and classify the consonants of a large number of languages. It would be in place to point out here that some consonants require two simultaneous articulations — a primary articulation and a secondary articulation. In such cases there are two points in the oral tract at which an active articulator moves towards a passive articulator simultaneously. Take the example of the initial consonant in the English word watch. It is produced by bringing the lips together and **at the same time** raising the back of the tongue towards the soft palate.

#### 2.1.4 Manner of Articulation

As we have already seen **manner of articulation** refers to the specification of the kind of closure or narrowing in the production of a sound. In order to give a complete description of a consonant it is absolutely necessary to specify the manner of articulation. For example, if two consonants are described as voiced and as having the same place of articulation (such as the initial consonants in the English words dew and zoo which are alveolars) we cannot differentiate between them unless we also state **how** each one is produced, for they differ from each other only in respect of manner of articulation.

The classification of consonants according to manner of articulation, is done under the following categories.

- (a) **Plosive:** In the production of a plosive there is a complete closure of the articulators at some point in the vocal tract thus completing shutting off the air passage. The air is built up behind the closure and then suddenly removed, causing the sudden release of the blocked air with some explosive noise. For example, the initial sounds in the English words pit, bit, tip, dip, keep, goal are plosives - two are bilabial plosives, two alveolar plosives and two velar plosives, respectively.
- (b) **Affricate:** Affricates are produced by a complete closure of the air passage, followed by the building up of pressure behind the closure, and the gradual release of the blocked air. Affricates differ from plosives in respect of the third stage of production. Whereas the release of the blocked air is sudden in the production of plosives, the release of air is slow in Affricates because the articulators are drawn apart slowly. This results in some friction rather than an explosive noise as is the case in the production of plosives. For example, the initial sounds in the English words, choice and joy.
- (c) **Nasal:** Nasals are those consonants in the production of which there is a complete closure of the oral passage while the nasal passage remains open, so that the air passes freely through the nose. The velum is lowered to allow the air free passage through the nasal cavity. For example, the medial sounds in the English words simmer, sinner, singer (represented by the spelling mm, nn, ng) are nasal consonants. Similarly, the Hindi consonants म as in काम, न as in नाक, ण as in गुण are nasal consonants.
- (d) **Trill or Roll** Consonants produced by the intermittent taps of the active articulator against the passive articulator are called Trill or Rolls. No closure is involved in the production of these sounds. The repeated taps of the tip of the tongue against the teeth (or just behind it), or the uvula against the back of the tongue result in the intermittent passage of air between the articulators. English does not have any Trills or Rolls. However, in an extended and

emphatic articulation of the initial sound in the English words red, round for example, the resultant sound would be a Trill or a Roll.

- e) **Flap** Whereas the production of a roll consists of several taps of the active articulator against the passive articulator, the production of a flap involves only a single tap of the active articulator against the passive articulator. For example, in Hindi ड़ in टोड़ (break) is a retroflex flap and र in परी (fairy) is an alveolar flap. In English, the r sound is very often produced as a flap when it occurs between two vowel sounds, for example, variety, various.
- f) **Lateral:** In the production of a lateral, though the centre of the oral tract is closed owing to a contact between the active and the passive articulator at some point in the vocal tract, the air escapes from the sides of the contact. This is possible because the rims of the tongue are lowered. Since the air can pass continuously the sound produced is a continual one that is, there is no obstruction to the passage of air. For example, the initial consonant in the English word left, or in the Hindi word लम्बा (tall).
- (g) **Fricative:** To produce a fricative there is no closure made anywhere, there is only a narrowing. The active articulator moves towards the passive articulator at some point in the vocal tract, so that there is a very narrow gap for the air to pass through. This causes audible friction. Since the air can pass continuously, the sound produced in this manner can be continued, unlike a plosive and an affricate. For example: the initial sounds in the English words below are fricatives: face, veil, think, those, see, zebra, sheep, have. The initial sounds in the Urdu words ख़राब (bad) and ग़लत (wrong) are also fricatives. In the production of fricatives the narrowing can take place in the centre of the vocal tract so that the air passes out into the outer atmosphere through the central passage. It can also take place on the sides so that the rims of the tongue move towards the upper teeth. There is a complete closure at the centre between the tip of the tongue and the centre of the teeth ridge so that the air escapes with friction through the narrowing on the sides of the vocal tract between the rims of the tongue and the upper teeth. Sounds thus produced are **lateral fricatives**. For example, the initial consonant in the Welsh word llan (church). English has no lateral fricatives.
- (h) **Frictionless Continuant:** Unlike fricatives (for the production of which the degree of narrowing is enough to cause audible friction in the sound produced) frictionless continuants are produced by a lesser degree of narrowing of the articulators so that the air passes out freely and no audible friction accompanies the sound produced. The sound can be continued. For example, the initial consonant in the English words reel, road, reason is a frictionless continuant in Standard British English, and the initial consonant in the Hindi words बह, बीर, बायू are also frictionless continuants.
- You must have noticed that the English consonant in the initial position in words like veil, vine, vow is a fricative and different from the frictionless continuant व in Hindi.
- i) **Semi-vowel:** Semi-vowels are vowel-like in phonetic form but function as consonants. For example, the initial consonants in the English words weight and yawn and the Hindi word याद (which is the same as the initial consonant yawn)

We must make a note of the fact that frictionless continuants and semi-vowels defined in strictly phonetic terms should be regarded as vowels because in their production there is no obstruction or narrowing in the oral passage to cause friction. But in many languages these sounds function as consonants, so they are generally grouped along with the consonants.

We shall now classify and describe consonants in detail using the criteria we have discussed.

## Consonants & Vowels

- a) The sound represented by the letter **pp** in the English word copper
  - i) The air stream is **pulmonic**
  - ii) The air stream is **egressive**
  - iii) The vocal cords are apart and do not vibrate. The sound is therefore **voiceless**.
  - iv) The soft palate is raised. The sound is therefore **oral**, not nasal.
  - v) The articulation takes place at the lips. The upper lip is the passive articulator and the lower lip the active articulator. The sound is therefore **bi-labial**.
  - vi) The sound is produced by a complete closure of the mouth, the building up of air pressure behind the closure, and then a sudden release of the blocked air with some explosive noise. The sound is thus a **plosive**.
- b) The sound represented by the letter **v** in the English word favourite.
  - i) The air stream is **pulmonic**
  - ii) The air stream is **egressive**
  - iii) The vocal cords vibrate. The consonant is therefore **voiced**.
  - iv) The soft palate is raised and the sound is **oral**
  - v) The articulation takes place between the lower lip and the upper teeth. The letter is the active articulator, the former the passive articulator. The sound is **labio-dental**.
  - vi) The sound is produced by a narrowing between the upper teeth and the lower lip so that the air passes through the narrow passage with audible friction. The sound is therefore a **fricative**.
- c) The sound represented by the letters **nn** in the word banner.
  - i) The air stream is **pulmonic**
  - ii) The air stream is **egressive**.
  - iii) The vocal cords vibrate. The sound is therefore **voiced**.
  - iv) The soft palate is lowered to let the air out through the nasal passage. The sound is therefore **nasal**.
  - v) The articulation takes place at the alveolar ridge. The tip or blade of the tongue (active articulator) makes contact with the alveolar ridge (passive articulator). The consonant is thus **alveolar**.
  - vi) There is a complete closure of the air passage through the oral tract and the velum is lowered so that the air passes out through the nose only. Thus the sound is a **nasal**.
- d) The final sound in the Hindi word **वेड़** (tree)
  - i) The air stream is **pulmonic**
  - ii) The airstream is **egressive**
  - iii) The vocal cords vibrate. The sound is therefore **voiced**.
  - iv) The soft palate is raised. The sound is **oral**.
  - v) The articulation takes place between the tip of the tongue curled back and the front of the hard palate. The sound is therefore **retroflex**.
  - vi) The tip of the tongue curls back and the underside makes a single tap against the front of the hard palate. The sound is thus a **flap**.
- (e) The sound represented by the letters **ll** in the English word fellow.
  - (i) The airstream is **pulmonic**
  - (ii) The airstream is **egressive**.

- (iii) The vocal cords vibrate. The sound is **voiced**.
- (iv) The soft palate is raised and the sound is **oral**.
- (v) The active articulator the tip of the tongue, articulates with the centre of alveolar ridge (passive articulator). The sound is therefore **alveolar**.
- (vi) While there is a contact between the tip of the tongue and the alveolar ridge the rims of the tongue are lowered to let out the air from the lungs through the sides. The sound is therefore a **lateral**.

### 2.1.5 A brief phonetic description of consonants

We have seen that in detailed Phonetic description of consonants the terms pulmonic and egressive are common to all the consonants, that is, the answers to questions (i) and (ii) are the same in all cases. We can therefore, take these answers for granted. Notice that except in the case of nasal consonants the soft palate is raised. Since the identification of nasal consonants is possible by answering the last question (vi), question 4 becomes redundant. Thus questions 1,2 and 4 need not be asked. As a result, it becomes possible to describe consonants briefly by answering questions: 3,5 and 6. Thus the consonants we have described in detail above can be described as

- (a) (iii) voiceless (v) bilabial (vi) plosive
- (b) (iii) voiced (v) labio-dental (vi) fricative
- (c) (iii) voiced (v) alveolar (vi) nasal
- (d) (iii) voiced (v) retroflex (vi) flap
- (e) (iii) voiced (v) alveolar (vi) lateral

We have thus described these consonants with reference to the **position of the vocal cords, the place of articulation and the manner of articulation**. A brief description of consonants must, of course, be made only after we have studied and understood what these terms mean, for only then can we identify consonants.

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## 2.2 DESCRIPTION AND CLASSIFICATION OF VOWELS

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### 2.2.1 Introduction

In unit 1 we saw that the two general classes 'vowel' and 'consonant' differed from each other in respect of the passage of the air-stream. In the production of a vowel there is no obstruction to the air in the pharynx and the mouth, nor is there any narrowing to the extent that it causes audible friction. Vowels generally have a 'hum' when produced. In other words, vowels are normally **voiced**. The features distinguishing 'vowel' from 'consonant' do not help us to distinguish between different vowels, nor do the criteria we have used in the previous section to describe and classify consonants. We have, therefore, to set up criteria for the description and classification of vowels; for example, the criteria should enable us to distinguish between the vowels in the English words, feed and food or between vowels such as those in the Hindi words दिन and विन. The differences between vowels here are broadly of two types: **difference of quality**, as illustrated by the pair feed and food and **differences of quantity** as illustrated by the pair of Hindi words. Difference of quantity is a difference in the length of vowels. Difference of quality is more complex and needs to be examined in greater detail.

### 2.2.2 Criteria for the description of vowels

Since the passage of air is free and unobstructed for the production of vowels, we have to determine the differences in their quality with reference to the modifications that take place in the shapes and sizes of the resonating chambers through which the tone passes, that is the pharyngeal cavity, the nasal cavity and the mouth. The **soft**