

Chapter-1

Introduction

1.1 General Background

The speech sound is minimal part of the word. So, it exists as the basic unit of human language. It is phonetically distinct unit of sound which is produced by the speech-organs and it can be distinguished by the phonetician from all other units of sound produced by the speech-organs. Practically there is no limit of number of different speech sounds that can be produced by the human speech-organs and distinguished by the phonetician speech-sound is somewhat indeterminate in nature. Phoneticians will bring various instrumental techniques for measuring the acoustic properties of sound and there will be last resort for minute differences and discrepancies. But the fact is that there is no natural limit to the divisibility of the range of sounds used in speech.

Speech sounds of all languages are classified, first and foremost, into vowels and consonants. These two categories are defined differently in different descriptions. In phonetic terms, a speech sound is defined as a 'vowel' if there is no obstruction and no narrowing of a degree that would cause audible friction while producing the sound. But consonants are those sounds that are produced with the obstruction of air-stream somewhere in the speech organs. David crystal defines consonants as:

Consonants can be defined in terms of both phonetics and phonology, phonetically, they are sounds made by a closure or narrowing in the vocal tract so that the airflow is either completely blocked, or so restricted that audible friction is produced. Consonant articulations are relatively easy to feel, and as a result are most conveniently described in terms of place and manner of articulation. In addition, a routine phonetic description of consonants would involve information about the mode of vibration of the vocal cords, and it is often necessary to specify the duration of the sound, the airstream mechanism involved and the direction of airflow (egressive or ingressive). From a phonological point of view, consonants are those units, which function at the margins of syllables, either singly or in clusters. (98)

The sound is studied on the phonological level in one hand and phonetically on the other. Phonetics is the study of a pure science, which consists all human vocal sounds with special attention to those sounds, which occur in the world's language. It studies the physical properties of sound from production, transmission and perception point of view. It is general study of speech sound with out any concern of any particular language as it studies the defining characteristics of all human vocal sounds.

On the other hand phonology is the study of sound system in particular languages. It is an arrangement of sounds in a characteristic pattern in a particular

language. It studies vocal sounds, their change, phoneme and their variants. It is concerned with the structure and function of the speech sounds in conveying meaning. So phonology can be called functional phonetics.

Among all the consonants, due attention will be given regarding the plosives; on the basis of their various aspects. Defining plosives David crystal says:

It refers to a sound made when a complete closure in the vocal tract is suddenly released; the air-pressure, which had built up behind the closure, rushes out with an explosive sound, hence the term is used to refer to the outwards movement of air upon release. Plosive consonants are one type of stop consonant. Example in English are (p, b, t, d, k). (357)

However, oxford-Advanced Learner's dictionary defines plosives as "a speech sound made by stopping the flow of air coming out of the mouth and then suddenly releasing it" (1158).

The above-mentioned definitions make it clear that the plosives are articulated suddenly. The air is blocked somewhere in the oral passage for a while and then with an explosion the sound comes out when the closure is suddenly removed. So the production of plosives is made with the complete obstruction of the two or more articulators.

Both English and Nepali languages have certain number of plosives. This study tries to show the similarities and differences of plosives in various aspects,

which will be fruitful to the learners of both languages. The aim of this comparative study will be to facilitate not only Nepali people learning English but also those foreigners who want to learn Nepali. This study mainly focuses on the spoken aspect of language. While doing so, the plosive sounds of both languages are taken into discussion. Plosive sounds are supposed to cause great problems to the speakers. It has created lots of problems in the process of learning both languages. There is no exact translation of sounds into each other. So, the learners of one language naturally feel difficult in case of comparison with another language.

1.2 Literature Review

Different linguists and grammarians have attempted to study and analyze the sound and structure of both languages but separately. Though some linguists and grammarians have attempted, they have left many aspects untouched, so, in this study, I have attempted to make the comparative study of both Nepali and English plosive sounds regarding production, classification and analysis to the possible extent.

In English, many linguists and grammarians have done detailed study on plosives. Some of them are: Danial Jones (1979), J.D.O. connor (1992), peter Roach (1979). Defining the plosives Danial Jones says, "Plosive consonants are formed by completely closing the air passage, then compressing the air and suddenly opening the passage, so that the air escapes making an explosive sound" (138).

He further says that there are six plosive consonant phonemes in English. /p/, /b/, /t/, /d/, /k/ & /g/. He has also considered glottal stop /ʔ/ as a less important sound symbol of plosives (138).

Another linguist Peter Roach has pointed out the following features of plosives.

One articulator is moved against another or two articulators are moved against each other, so as to form a stricture that allows no air to escape from the vocal tract. The stricture is, then, total.

After his stricture has been formed and air has been compressed behind it, it is released, that is, air is allowed to escape.

If the air behind the stricture is still under pressure when the plosive is released it is probable that the escape of air will produce noise loud enough to be heard. This noise is called plosive.

There may be voicing during part of all of the plosive articulation.

(31)

To give a complete description of the production of plosive consonants Roach has divided the way of production into following four phases:

- i. The first phase is when the articulator or articulators move to form the stricture for the plosive. We call this the closure phase.
- ii. The second phase is when the compressed air is stopped from escaping. We call this the hold phase.

- iii. The third phase is when the articulators used to form the stricture are moved so as to allow air to escape. This is the release phase.
- iv. The fourth phase is what happened immediately after. (iii), so we will call it the post-release phase. (31)

Roach has presented the plosive phonemes of English in the form of a table as shown below:

PLACE OF ARTICULATION			
FORTIS	Bilabial	Alveolar	Velar
("Voiceless")	p	t	k
Lenis	b	d	g
("Voiced")			

Table no. 1 (Roach 34)

The given table clarifies that on the basis of place of articulation the sounds /p/ & /b/ are bilabial, /t/ and /d/ are alveolar and /k/ and /g/ are velar plosives. Similarly the sounds /p/, /t/ /k/ are Voiceless and these sounds are also called fortis and the sound /b/, /d/ /g/ are voiced which are also called lenis.

Unlike other linguists conor has analyzed the plosive consonants on the basis of strong and weak. According to him, there are four pairs of phonemes containing stops /p,b/, /t,d/, /k,g/ and /tʃ/, dʒ / one of each pair is strong and the other weak. (39). Regarding the plosive consonants, he says "In stop consonants the breath is completely stopped at some point in the mouth by the lips or tongue tip or tongue back, and then released with a slight explosion" (39).

Similarly many attempts have been made to describe plosives in Nepali by many Nepali linguists and grammarians like M. Pokharel (2057 B.S.), M. Sharma (2054 B.S.), Gautam and Luitel (2053 B.S.) and others. M. Sharma defines the plosives as "वायु मार्गमा पुरै बाधा वेहोरी उच्चरित हुने व्यञ्जनलाई स्पर्श व्यञ्जन भनिन्छ । यस्ता व्यञ्जनहरू फोक्सावाट आउने सास (वायु अवरुद्ध सासको सहासामोचन भई उच्चरित हुन्छन् " 'Plosive consonants are uttered by completely closing the air passage. In the production of these sounds the compressed air from the lungs removes the blocking and escapes making an explosive sound '(13-14).

Gautam and Luitel have also made detailed study of Nepali plosive consonant sounds. They say "उच्चारण अवयवहरू एक अर्कामा छोई सास पुरै अवरुद्ध भएर त्यस अवरुद्ध सासले उच्चारण अवयवलाई दबाव दिएपछि ती अवयव एकाएक खुल्दा उच्चरित हुने ध्वनिलाई स्पर्शी ध्वनी भनिन्छ" 'While pronouncing the plosive consonant sounds our breathing is blocked by the touch of related organs. When the blocking is removed by the air force, the sound is pronounced' (95).

They have categorized the plosives on the basis of place of articulation as follows:

i. **Bilabial Plosive** : The plosive articulated by the two lips. The bilabial plosive are:

प् /p/ फ् /ph/ ब् /b/ भ् /bh/ म् /m/

ii. **Dental Plosive**: Dental plosives are articulated by the tip of the tongue against the upper teeth. They are:

त् /t/ थ् /th/ द् /d/ ध् /dh/

iii. **Alveolar Plosive:** न् /n/ alveolar plosive is articulated by the tip or blade of the tongue against the teeth ridge.

iv. **Retroflex Plosive:** The plosives articulated by the tip of tongue against the retroflex. These sounds are:

ट् /t/ ठ् /th/ ड् /d/ ढ् /dh/

v. **Velar Plosive:** The plosives articulated by the back of the tongue against the central and the soft palate. They are:

क् /k/ ख् /kh/ ग् /g/ घ् /gh/ ङ्/ŋ/ (95).

They have also analyzed the plosives on the basis of voicing as follows:

Voiced:

ब्,	भ्,	द्व्,	ध्व्
/b/,	/bh/,	/d/,	/ <u>dh</u> /,
ड्,	ढ्,	ग्,	घ्,
/d/,	/dh/,	/g/,	/gh/,
ङ्,	म्,	न्	
/ /,	/m/,	/n/	

Voiceless

प्,	फ्,	त्,	थ्,	ट्,
/p/,	/ph/,	/t/,	/th/,	/t/,
ठ्,	क्,	ख्		
/th/,	/k/,	/kh/		(99)

In another way, they have described them on the basis of aspiration. They are:

Unaspirated:

प्,	ब्,	त्,	द्व्,	ट्,
/p/,	/b/,	/t/,	/d/,	/t/,

	ड ,	क ,	ग ,	न ,	ड ,
	/d/,	/k/,	/g/,	/n/,	/ /,
Aspirated:	फ ,	भ ,	थ ,	ध ,	ठ ,
	/ph/,	/bh/,	/th/,	/dh/,	/th/,
	ढ ,	ख ,	घ		
	/dh/,	/kh/,	/gh/	(100)	

1.3 Objectives of the Study:

The objectives of this study are:

- i. To find out the similarities and differences between plosives of English and Nepali languages.
- ii. To find out whether the plosives of both languages are quite translatable into each other or not.

1.4 Hypothesis:

In spite of some similarities between Nepali and English plosive consonant sounds there are a lot of differences and they are not fully translatable into each other.

1.5 Statement of the Problem

This study chiefly concerns the production, classification, comparison and contrast of English and Nepali plosives. This study aims at finding out the solutions to the following queries.

- i. What are the similarities and differences between Nepali and English plosives?
- ii. Are plosives of Nepali and English quite translatable into each other or not?

1.6 Methodology

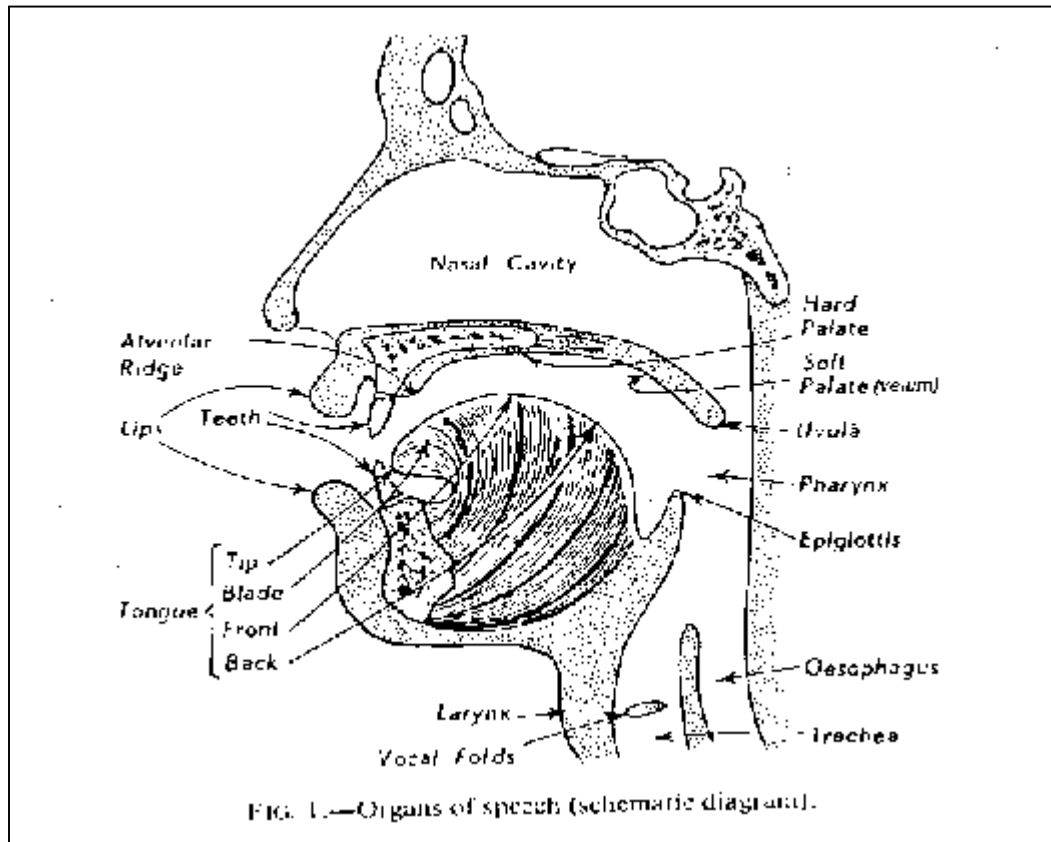
In course of this study both primary and secondary data are used. The primary data are first hand research, unpublished data and researcher's institutions about Nepali language. Already published literature journals, articles etc. are included as the secondary data. Further more various works and references are applied. The guidelines and suggestions of supervisor and scholars are also very useful. For the detailed study of plosives of both languages, different diagrams related to both plosives are made. In process of classification and analysis various techniques used by previous scholars are applied, comparative technique is followed for the research study.

Taking these views and opinions into account, the present study will make detailed comparative study of English & Nepali plosive sounds.

Chapter-2

Organs of Speech Involved to Produce Plosives

The lungs, vocal cords, tongue, lips etc. are considered to be the major organs of speech. Different organs have different jobs of their own. When we want to understand the speech process from the speech production point of view, it is necessary to know a lot about the functioning of these organs. The account of the vocal organs, which follows in brief, will be fruitful information to describe how sounds are made and how they are classified on an articulatory basis. The organs



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Figure number 1 (Gimson page-10)

2.1 The Lungs

Most sounds of all languages are produced with the outgoing breath from the lungs. By the action of the ribs and the diaphragm air is caused to flow into and out of the lungs. The ribs are capable of a certain amount of movement, which are connected to the spine and to the breastbone. The upward and out ward movement of the ribs can be clearly felt by placing the hands on the lower ribs on both sides and breathing deeply.

Lungs are the seed shaped organs, which play pivotal role not only in respiration but also in making main contribution to sound production.

We need a type of energy to produce speech sounds. The energy is the air stream sent out by our lungs. The air released by the lungs changes into sound when it arrives at the larynx that contains the vocal cords. Thus the lungs are the energy supplier and initiator of the speech sounds. For instance during the articulation of /p/ the back of the tongue is raised to block the nasal cavity and all air is stopped in the oral passage by closing the lips. When the lips are opened the air escapes suddenly. The force of air comes from the lungs.

2.2 The Larynx

The larynx is a fairly rigid box made up of cartilages, situated at the top of the trachea. All air passing in and out of the lungs must pass through it. Inside the larynx there are vocal cords. They consist of two bands of muscles. The front part of it can be seen at man's throat, which is called Adam's Apple. It is also called the voice box. Its size differs between male and female.

2.3 The Vocal Cords

The wind-pipe (Trachea) contains two membranous tissues. These two tissues are like a pair of lips. They are called vocal cords, which are placed horizontally from front to back. Vocal cords are joined in the front, but can be separated at the back. The opening of the vocal cords is called glottis. David crystal defines the vocal cords as:

Two muscular folds running from a single point inside the front of the thyroid cartilage (Adam's apple), backwards to the front ends of the arytenoids cartilages. The vocal cords are very flexible, being

shaped by the combined activities of the associated cartilages and muscles. The space between them is known as the glottis. (373)

2.4 States or Positions of the Glottis

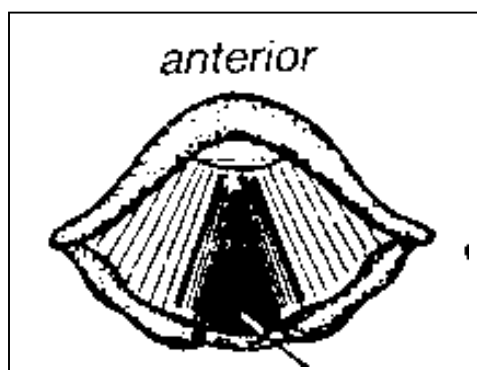
Regarding the states & functions of the vocal cords crystal says:

The vocal cords have several functions. Their main role in speech is to vibrate in such a manner as to produce voice, a process known as phonation. When the cords are not vibrating, two main alternative positions are available. They may be tightly closed, as when the breath is held a process, which produces a glottal stop up on release. Or they may remain open, so that the breath flowing the glottis produces audible friction as in whispering and the /h/ sound. Other phonation types are possible by varying the mode of vibration of the vocal cords in various ways, as in breathy and creaky voice. Varying the thickness length and tension of the vocal cords also produces the different registers in voice production lastly. By varying the rate and strength of vibration of the vocals cords, variations in pitch & loudness can be introduced into speech. (373)

According to the action the vocal cords they bring about a variety of different states of the glottis. Linguistically the following positions are significant.

2.4.1 Open Glottis

The position of
shown in the following



open glottis is
figure.

Figure number 2 (Gimson Page-11)

In this situation, presented in fig no. 2, the glottis may be open, normal breathing is possible and voiceless sounds can be produced. There will be free passage of air for voiceless sounds. The vocal cords are drawn apart which give way to pass the air and there is no of vibration for such sounds. e.g. /p/, /t/, /k/ etc.

Sharma and Luitel say. "स्वरचिम्टी पुरै खुला रही बाधारहित ढंगले सास बाहिर निस्कदा प्रकम्पन वा घर्षण हुँदैन र स्वर एवं अघोष ध्वनि उच्चरित हुन्छन् " 'The vocal cords remain wide apart and the passage is open so the air comes without vibration. In such condition voiceless sounds are articulated' (53).

2.4.2 Narrow Glottis

The position of narrow glottis is shown in the following figure.

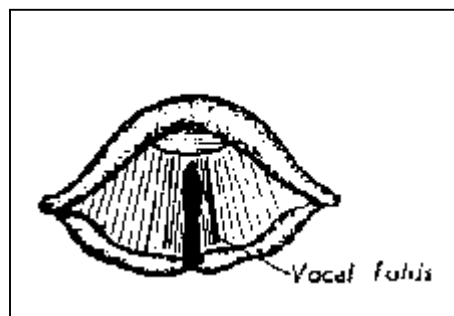


Figure number 3 (Gimson page-10)

As shown in figure no. 3 because of the vibration of the vocal cords the glottis may be narrower. In such situation voiced sounds can be produced. The vocal cords are brought together loosely and the air from the lungs forces them vibrate due to which voiced sounds are produced. The plosives /b/ /d/ /g/ are produced in this stage. Sharma and Luitel say: “स्वरचिम्टी नजिकिइ वायुमार्ग साँघुरो हुँदा दवावका कारण स्वरचिम्टीहरु प्रकम्पित हुन्छन् र यस्तो अवस्थामा घोष ध्वनिको उच्चारण हुन्छ” 'The vocal cords are close together and the air from the lungs vibrates them. Then voiced plosives are articulated' (53).

2.4.3 Closed Glottis

The position of closed glottis is shown in the following figure.

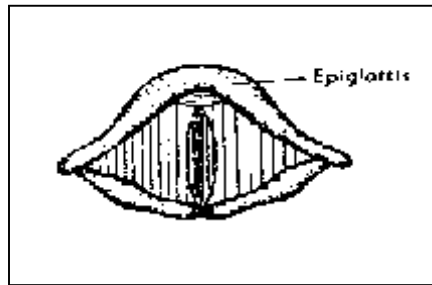


Figure number 4 (Gimson page-11)

In such situation the glottis is closed and vocal cords completely stop the airflow but the compressed air from the lungs pushes it forcefully due to which the vocal cords open suddenly and the compressed air bursts out with an audible friction as a result, the glottal stops are produced.

Sharma and Luitel say “स्वरचिम्टी एकअर्कासँग जोडिई वायुमार्ग पूरै बन्द गरेर एक्कासि खुली सास बाहिर आउँदा स्वरयन्त्रमुखी स्पर्शी ध्वनि उच्चरित हुन्छन् ” 'When the vocal cords are closed and the air is blocked the glottal plosives are articulated with the sudden release' (53).

2.5 The Nasal Cavity

The nasal cavity like the violin body is of fixed dimensions and shape, and its contributions to speech is entirely a matter of resonance. If with the vocal cords vibrating, the soft palate is lowered so that the pharynx and nasal cavity and oral cavity are connected the whole mass of air in the connected cavities vibrates with a characteristic nasal effect. If the mouth is open and soft palate is lowered, then the vibrating air goes out of both mouth and nostrils, the sound will be nasalized.

If the passage through the nose is blocked at the back of the nasal cavity, neither nasal nor nasalized sounds will be possible, because air cannot enter. If the passage is blocked at the nostrils, as with a cold, nasalized sounds will still be perfectly possible because air can resonate in the nasal cavity, but nasal sounds will be heavily impaired.

Defining the nasal cavity Nepali linguists Guatam & Luitel Say: "घोकाको नाकेक्षेत्रसँग जोडिएको खुला टोडको नाके ओढार हो । यो सबभन्दा माथिल्लो श्वासमार्ग हो । यसका बाहिरै दुइटा दुला हुन्छन् । कोमलतालु तलभरी मुखे ओढारको बाटो बन्द गरिदिँदा नाकतिरबाट तलभरी मुखे ओढारको बाटो बन्द गरिदिँदा नाकतिरबाट सास बाहिर निस्कन्छ । यस अवस्थामा नासिक्य ध्वनि उच्चरित हुन्छन् " "The open area connecting nasal area with pharynx is called nasal cavity. It is the upper most air passage. This cavity has two outside holes. When the soft palate is lowered it blocks the way of oral cavity and the air passes through nasal cavity in such situation nasal sounds are articulated' (21).

2.6 The Oral Cavity

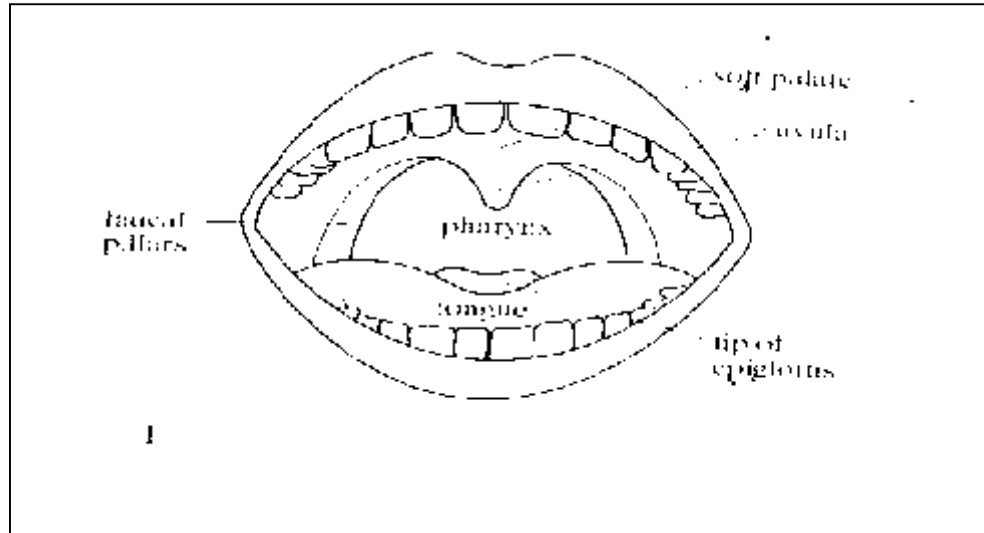


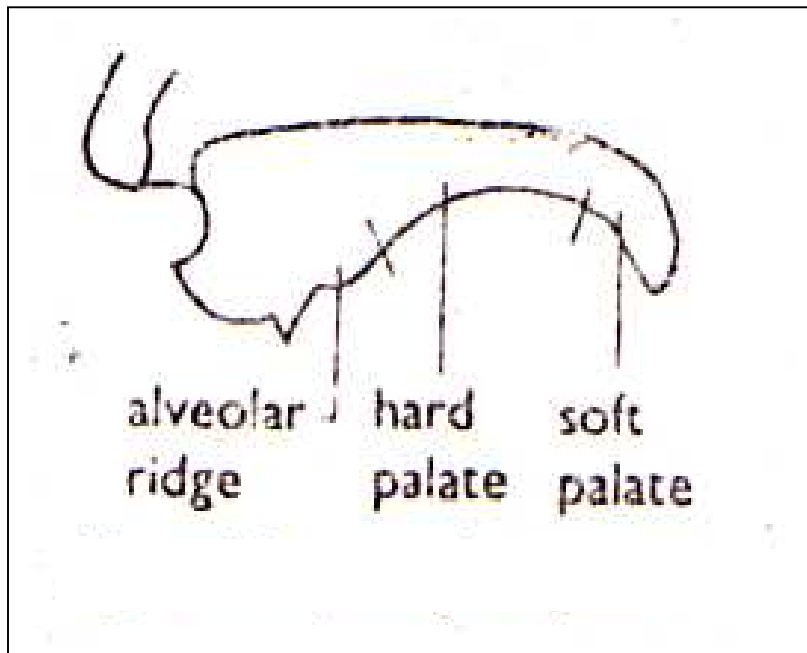
Figure number 5 (J.C. catford - page- 79)

The oral cavity is far the most important of the three cavities because it is the most variable in dimensions and in shape. This is due partly to the mobility of the lower jaw, partly to that of the lips, but overwhelmingly to the tongue.

The oral cavity is bounded at the top by the palate. This is a dome shaped structure whose front part is bony and fixed and the back part, the soft palate, is moveable. Hard palate, soft palate, uvula jaw, tongue etc. are the different parts of oral cavity as shown in fig no. 5, Articulations in the oral area are carried out by the juxtaposition of lower and upper articulators. The lower articulators are those attached to the lower jaw the lower lip, the lower teeth, and tongue. The upper articulators are the upper lip, the upper teeth and the whole of the roof of the mouth. The floor of the mouth is mostly occupied by the tongue, which can be put into many different shapes and positions.

2.6.1 The Palate

The palate is the roof of the mouth. It can be divided into three parts- soft palate at the back, the hard palate in the middle and the alveolar ridge just behind the upper front teeth. The palate is supposed as the wall of oral cavity and Nasal cavity. The parts of the palate are shown in the following figure.



Figurer number 6 Source (J.D. oconor page-17)

2.6.2 Alveolar Ridge:

It is the part of the gums immediately behind the upper front teeth. It is also called teeth ridge. It has an important role to produce many consonant sounds in English and Nepali.

2.6.3 Hard Palate:

It is the highest part of the palate between the alveolar ridge and the soft palate. Oxford Concience dictionary of linguistics defines "The roof of the mouth between the back of the ridge behind the teeth and the fleshy part called soft palate. Palatal consonants are articulated in this area" (157).

2.6.4 Soft Palate:

It is the back part of the palate. It is the flexible or moveable part. It is also called velum. It can be raised or lowered. When it is raised, the nasal passage is blocked. This position is called the velic closure. Oral sounds are produced with velic closure. When the velum is lowered. The oral passage is closed and the air goes out through the nose. This position is called the oral closure. Oxford Concience dictionary of linguistics defines "The back part of the roof of the mouth, which, is soft or fleshy in the comparison with the bony or hard palate to the front. Also called the velum" (345).

2.6.5 The Teeth

The teeth also play an important role for the production of speech sounds. There are upper and lower teeth. The sounds articulated by the tip of the tongue against the upper teeth are dental sounds. Some sounds are articulated with the tongue near the teeth or against the teeth. In English dental plosives are not found but Nepali sounds त् /t/, थ् /th/, द् /d/ and ध् /dh/ are dental plosives.

2.6.6 The Tongue

The tongue is the most important movable organ of speech. It is the main articulating organ. Changing the shape and position of the tongue produces different sounds. It can be divided into four parts as given below.

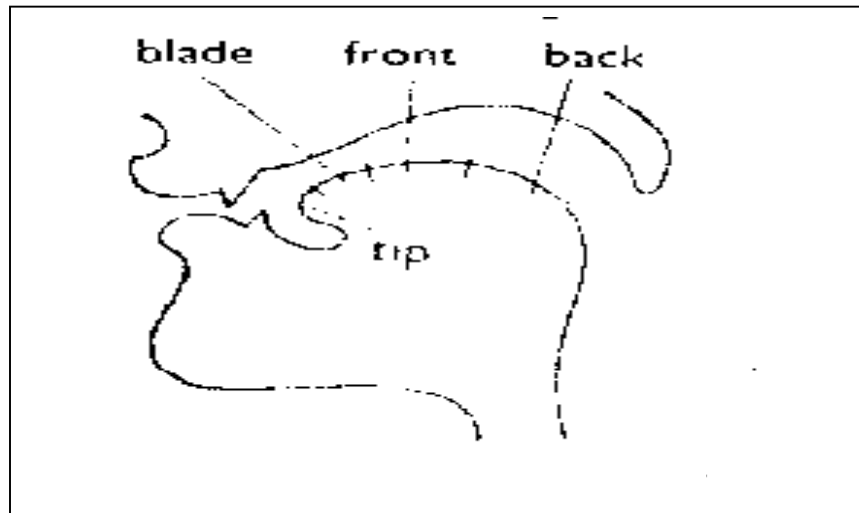


Figure number 7 (conor 18)

- i. **The Tip of the Tongue:** It is the most front edge part of the tongue, which lies under the alveolar ridge when the tongue is at rest. It is the part right at the front of the blade. It is the mobile or flexible part. It is also called apex.
- ii. **The blade of the Tongue:** It is the part of the tongue between the tip and the front of the tongue. It lies under the alveolar ridge when the tongue is at rest. It is mobile because it can touch the lips, the teeth, the alveolar ridge and the hard palate. It is also called lamina.
- iii. **The front of the Tongue:** It is the part behind the blade, which lies under the hard palate.

- iv. **The back of the Tongue:** It is the back part behind the front, which lies under the soft palate. It is also called dorsum.

2.6.7 The Lips

The lips are the doors of the oral cavity. They are the articulatory organs for the production of bilabial and labia-dental sounds. The lips change their various different positions in the production of the different sounds. Both the lips join and block the air for a short time when they release the air, it produced the stop bilabial sounds /p,b/. The upper lip touches the lower lip and makes space that the air passes with friction.

2.7 Airstream Mechanism

Although air is not speech organ, it plays a pivotal role in the production of speech sounds. In absence of it no sounds can be articulated. Airstream means the mass of moving air. Crystal defines it as:

Airstream mechanism: A term used in phonetics for a physiological process which provides as sources of energy capable of being used in speed sound production. Air is moved inwards or out wards by the movements of this mechanism, producing respectively an ingressive and an egressive airflow. (17)

Airstream mechanism is known as a mechanism with which the air moves. Different organs of speech play different role, some organs play the role of initiators and some others as passage. e.g. the diaphragm and rib cases play the

role of initiator and they send the air out. The organs like trachea, velum, mouth and nose etc. play the role of passages.

Similarly Nepali linguists Sharma and Luitel say: “सास भित्र पस्ने र बाहिर निस्कने क्रमलाई श्वासप्रवाह (airstream Mechanism) भनिन्छ” "The process of the air going in and out is called airstream mechanism' (55).

They further say “श्वासप्रवाहका दिशाहरु बाहिर्गमनात्मक (egressive) र अन्तर्गमनात्मक (engressive) गरी दुई प्रकारका हुन्छन् । बाहिर्गमनात्मक श्वासप्रवाहमा भित्रको सास बाहिर फालिन्छ र अन्तर्गमनात्मक श्वासप्रवाहमा बाहिरको सास भित्र तानिन्छ ” "There are two types of airstream mechanism, egressive and ingressive. In the egressive airstream mechanism the air comes out from the lungs and in ingressive airstream mechanism the air is pulled in through the mouth' (55).

Human speech sound can be produced according to initiation or termination of the air by the following three ways:

- a) Pulmonic Airstream Mechanism
- b) Glottalic Airstream Mechanism
- c) Velaric Airstream Mechanism

2.7.1 Pulmonic Airstream Mechanism

Oxford conscience dictionary of linguistics defines pulmonic Airstreams mechanism as: "pulmonic (air stream mechanism) in which a flow is initiated by a change in the volume of the lungs. Most normal speech is produced by such as air stream, specially by a pulmonic egressive air stream, in which air flows outwards as the volume of the lungs is reduced" (303).

In this airstream mechanism the lungs become the initiator of airflow for the production of speech. Lungs are the inner ends of the airways. So the initiated air from the lungs comes out only through the air passage. The sounds which are produced in this way are called pulmonic egressive. It is found that most of the human speech is produced by this mechanism. The stops, which are produced with pulmonic egressive airstream mechanism, are called plosives or plosive stops. They are: /p/, /b/, /d/, /k/, /t/, /g/.

Defining the pulmonic airstream mechanism Nepali linguists Sharma and Luitel say:

ध्वनि उत्पादनका लागि फोक्साको सास चलायमान हुने प्रक्रियालाई फोक्से स्वासप्रवाह भनिन्छ । मध्यपट (diaphragm) र अन्तर्करड मांशपेशी (intercostals) हरू फोक्सातिर आउँदा त्यहाँ रहेको सास बाहिर निस्कन्छ । यसरी फोक्साको सास बाहिर आउँदा विभिन्न स्थानका उच्चारण अवयवद्वारा श्वासप्रवाहमा बाधा उत्पन्न भई ध्वनि उच्चरित हुन्छ । नेपाली भाषाका सबैजसो ध्वनिहरू फोक्से श्वासप्रवाहबाट उच्चरित हुने फोक्से ध्वनि हुन् (56) Movement of air from the lung is necessary for the production of pulmonic airstream mechanism. When diaphragm and intercostals come close to the lungs the air comes out. The articulators creating obstacles in the respiration these sounds are articulated block the air in this way from the lungs. Almost all the sounds in Nepali are articulated by pulmonic airstream mechanism.

2.7.2 Glottalic Airstream Mechanism

Glottis becomes the point of air initiation. Glottalic airstream mechanism may be both ingressive and egressive.

In ingressive glottalic airstream mechanism the compressed air goes downward from the glottis, the point of initiation, and voiced implosive stops like /b/, /d/, /g/ etc. are produced. The downward moving larynx is not completely closed and the lungs are still pushing out the air, so the sounds are voiced. Oxford Concience dictionary of linguistics defines implosives as :

A stop produced by an airstream mechanism in which air is initially rarefied above the larynx. In the simplest case, the glottis is closed and a stop is articulated at some place of articulation forward of it; the larynx is then lowered, so that, when the forward closure is released, air is drawn inwards into the space behind it. The mechanism is, on this basis classed as glottalic and ingressive. But the drop in air pressure above the larynx also causes air to pass periodically upwards through the glottis: hence stops of this kind usually have an effect of voicing. A bilabial implosive /ɓ/ and dental/ alveolar implosive /ɗ/ are widespread e.g. in West African languages. (172)

In the egressive glottalic airstream mechanism when the air comes outward initiating from closed glottis, the closed glottis will move the air in the vocal tract out of the mouth by which it produces ejective stops like /pʰ/, /tʰ/, /kʰ/. David Crystal defines the ejectives stops as:

A term used in the phonetic classification of consonant sounds on the basis of their manner of articulation; it refers to the series of

sounds produced by using the glottalic Airstream mechanism. Air is compressed in the mouth or pharynx while the glottis remains closed, and then released,. Ejective plosives are quite common in languages (as in many languages of Africa and the Americans e.g. Quechua, Amharics), and ejective fricatives may also be found. These sounds are transcribed with a small raised Glottal stop, or an apostrophe, following the segment involved, e.g. [p'], [s']. Ejectives are also referred to as 'glottalic' sounds, and occasionally as glottalized sounds. (157)

The definition makes clear that ejective sounds are not important in English Language.

Similarly ejective sounds are defined in Nepali as well. Sharma and Luitel say:

“स्वरयन्त्रमुख प्रारम्भक भएर चलायमान हुने प्रकृत्यालाई श्वरयन्त्रमुखी श्वासप्रवाह भनिन्छ । स्वरयन्त्रमुख तल वा माथि सर्दा त्यसका र मुख विवरका कुनै ठाउँमा रोकिएर रहेको सास गतिशील हुँदा स्वरयन्त्रमुखी ध्वनि उच्चरित हुन्छ । यस श्वासप्रवाहबाट उच्चरित हुने सबै ध्वनिहरु घोष हुन्छन् । नेपाली भाषामा यस्तो ध्वनिको उच्चारण गरिदैन” 'Glottis becomes the point of initiation for glotalic airstream mechanism. Glotalic sounds are articulated when the glottis moves up and down and the air in oral passage makes a movement. These types of articulated sounds are voiced sounds. In Nepali this type of sounds are not articulated' (56).

2.7.3 Velaric Airstream Mechanism

In this mechanism, the back of the tongue comes close to the velum or soft palate. Then air stream begins. In such situation the air rushes inward and click

sounds are produced. Such mechanism is called ingressive velaric airstream mechanism. Oxford Concience dictionary of linguistics defines clicks as:

Sound produced by suction of the tongue against the roof of the mouth. A body of air is trapped between the back of the tongue, which is in contact with the velum and a second closure further forward. The space enclosed is then enlarged, the air within it is rarefied, and the second closure is released and air flows inwards.

(56)

In case of making such sounds breathing in and out is possible because the back of the tongue is touching the velum and the air stream flowing in and out of the nose is separated from the air in mouth used in making this sound. Sharma and Luitel say “जिब्राको पछिल्लो भाग कण्ठका छेउमा पुग्दा श्वास प्रवाहित हुने प्रक्रियालाई कण्ठे श्वासप्रवाह भनिन्छ । यस श्वासप्रवाहबाट नेपाली भाषामा ध्वनिको उच्चारण गरिदैन” "The back of the tongue touches velar while articulating such sounds. In Nepali generally such sounds are not articulated' (56).

Bhattari and Luitel have given some examples of click sounds as follows:

- i) Bilabial clicks are articulated to persuade the children. e.g. प्प, प्प /pup, pup/
- ii) Calling chickens, birds etc. ट्ट ट्ट /tut tut/

Similarly in English are also such sounds. David crystal Says " In English click sounds may be heard in the word 'tut tut' sound of disapproval, in some type of kiss, and in the noise used to signal appereciation or to 'gee up' horses (75).

Chapter-3

Classification of Plosives In English

3.1 Background:

The production of English plosive sounds can be classified on the basis of place of articulation, voicing and aspiration.

3.2 Plosives on the Basis of Place of Articulation

Place of articulation refers to the area in the oral/ nasal tract where the sounds are articulated. All the articulators do not have equal participation in course of speech articulation. Some organs are moveable and some are constant. The moveable organs are active articulators and constant organs are called passive articulators. Tongue, lower lip etc. are active articulators whereas upper teeth, upper lip, the palate etc. are passive articulators. On the basis of place of articulation English plosives can be categorized as bilabial alveolar and velar plosives.

3.2.1 Bilabial Plosives

The sounds /p/ & /b/ are bilabial plosives in English language because they are articulated with the active participation of upper lip and lower lip. Especially the lower lip functions as the active articulator and upper lip passive. The air from the lungs is blocked by the closure of the lips. There is velic closure so that the air can't escape from the nasal passage. When the lips are suddenly parted the air

comes out with an explosion and these sounds are produced. The position of organs of speech is shown in the in the following figure.

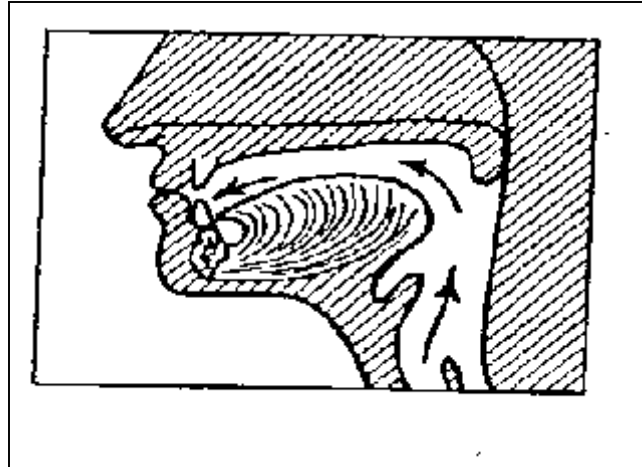


Figure number 8 (Gimson page- 162)

In the above figure the air is blocked by the lips. We can see velic closure, which blocks the air escaping from the nasal passage. The explosion comes when the lips are parted.

3.2.2 Alveolar Plosives

The sounds /t/ & /d/ are alveolar plosives in English and are articulated with the active participation of the tip of the tongue and the alveolar ridge. There is complete closure by the tip of the tongue against the alveolar ridge, and the soft palate is raised to block the nasal cavity due to which the air can not pass through the nasal cavity. The sound is produced when the tongue tip is parted from the alveolar ridge. For the production of alveolar sound, the tip of the tongue works as an active articulator and the alveolar ridge as an inactive articulator.

The position of the organs of speech for the production of /t/ & /d/ is shown in the following diagram.

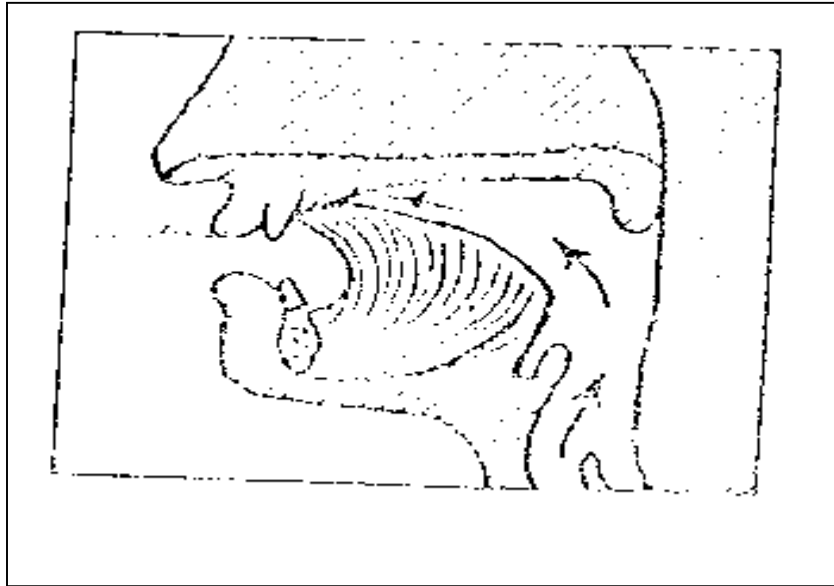


Figure number 9 (Gimson 164)

The arrow in the above picture shows the movements of air. The tongue has blocked the air by touching the alveolar ridge. There is velic closure so the air cannot escape through the nasal cavity. The air escapes suddenly when the tongue is parted from the alveolar ridge.

3.2.3 Velar Plosives

Velar plosives /k/ & /g/ are articulated by the active participation of the back of the tongue and soft palate. For the production of these sounds the back of the tongue works as an active articulator, and the soft palate remains passive. The back of the tongue blocks the air from the lungs when it touches the soft palate. Because of the velic closure at the same time the air cannot escape from the air passage. The sounds are articulated when these articulators are parted.

The position of the organs of speech for /k/ & /g/ is shown in the following diagram.

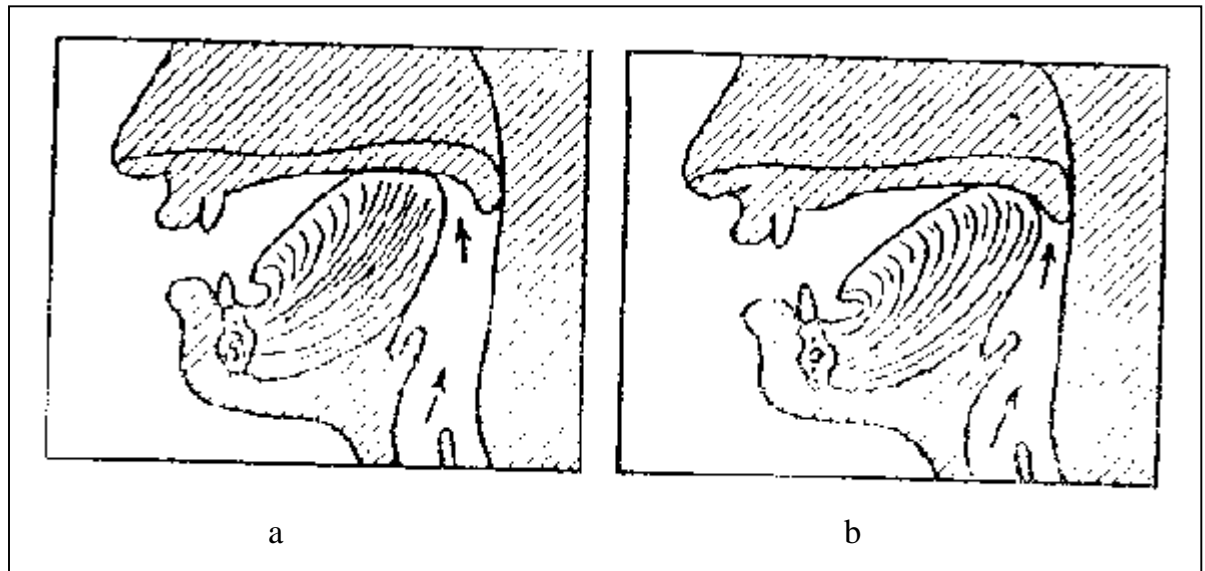


Figure number 10 (Gimson 166)

When /k/ is followed by a front vowel the contact of the tip of the tongue will be made on the most forward part of the soft palate and may even overlap on to the hard palate. Figure no. 10 a represents this type of articulation.

On the other hand when /k/ is followed by a back vowel the contact on the soft palate will be correspondingly retracted. Figure no. 10 b represents such type of articulation. Similarly when it is followed by vowel of a central type, a contact in the central region of the soft palate is made.

3.3 Plosives on the Basis of Voicing (Voiced & Voiceless)

The vibration of the vocal cords also plays an important role on the auditory result. This feature of the vocal cords determines the voicing quality of a sound. Voicing denotes the auditory result of the vocal cords. Sounds are also categorized on the basis of the way how the vocal cords are held either they are

brought together so that the air from the lungs causes them to vibrate, or they are held wide apart so that air from the lungs escapes freely without any vibration in the cords. On the basis of voicing plosives can be classified into two types: voiceless and voiced.

3.3.1 Voiceless Plosives

The plosives, which are produced without vibration of the vocal cords, are called voiceless plosives. While producing such sounds the vocal cords are held wide apart and they allow free passage of air for voiceless sounds. The Vibration of the vocal codes for the production of voiceless sounds is shown below:

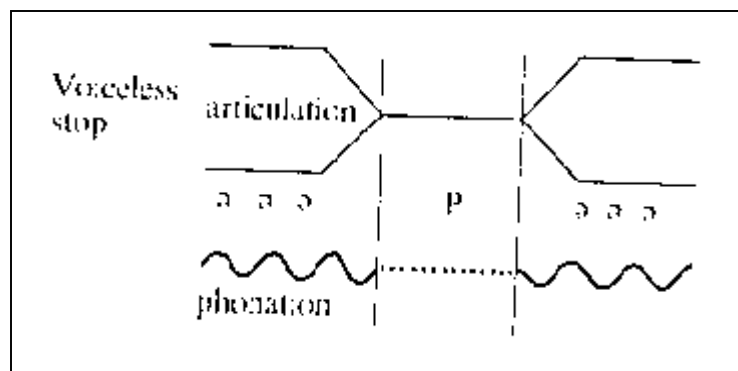


Figure number 11 (catford 48)

The glottis is open through which the compressed air from the lungs passes freely without any obstacle. English plosives /p/, /t/ & /k/ are articulated in this way. So these sounds are called voiceless plosives. The above figure diagrammatically, shows the voicelessness of stops. The lower wavy line symbolizes airflow and upper lines indicate the articulating organs in the diagram. The lower wavy line indicates vibration of the vocal cords. In the middle there is not curved line instead only dots are there representing the voicelessness of the

sound. The figure shows the articulation of /p/. And it also represents the articulatory process of voiceless plosives /t/ as well as /k/.

3.3.2 Voiced Plosives

The plosives, which are produced with the vibration of the vocal cords, are called voiced plosives. In the production of such sounds the vocal cords are loosely held together and the air from the lungs vibrates vocal cords and the audible sounds come as a result. The plosives /b/, /d/ & /g/ are articulated in this way. The vibration of the vocal codes for the production of voiced plosives is shown in the following figure.

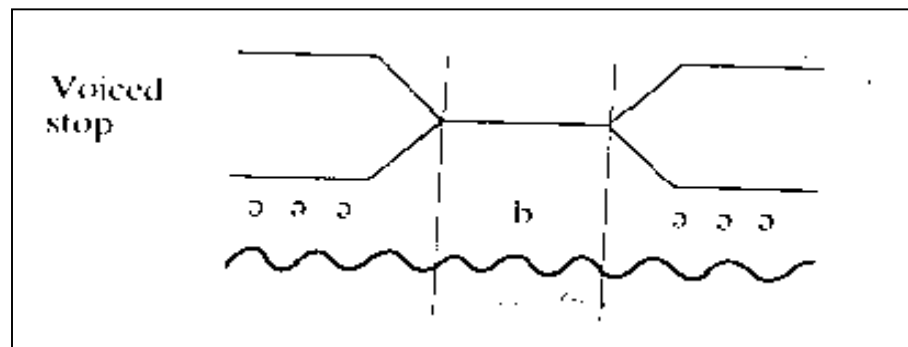


Figure number 12 (Cat ford Page-48)

The above figure shows the voiced characteristics of /b/ sound. The lower wavy line shows the airflow and upper line indicates the articulating organs. The lower wavy lines indicate vibration of the vocal cords, which is equally being curved. Wavy line in all the places indicates the sound /b/ as voiced. Similarly the articulatory process of other voiced plosives occur in this way.

These voiced plosives are not voiced everywhere. They are sometimes fully voiced, sometimes partly voiced and sometimes even voiceless when they are

partially devoiced. Regarding the initial voiced plosives Daniel Jones says, " In English when b, d and g occur initially, as when bee, **bi**, day **dei**, go **gou** are said by themselves, they are partially devoiced in the pronunciation of most people, that is to say, voice is not heard during the whole of the stop but only during part of it, generally the latter part." (154)

The duration of articulation affects the voiceness of the sounds. When they are articulated slowly and carefully they may be voiced but in rapid speech there is no voicing at all. Roach says, " If the speaker is pronouncing an initial /b/ /d/ or /g/ very slowly and carefully there may be voicing during the entire hold phase (the plosive is then fully voiced), while in rapid speech there may be no voicing at all"(32).

In the medial position such plosives have contextual characteristics either close to final or to initial plosives Roach says: " In general we can say that a medial plosive may have the characteristics either of final or of initial plosives" (33).

When /b/ /d/ /g/ occur in the final position, they are not easily audible. These sounds are heard in the latter phase. Roach says: " Final /b/ /d/ /g/ normally have little voicing if there is voicing, it is at the beginning of the hold phase" (33).

3.4 Plosives on the Basis of Strength of Production (Fortis & Lenis)

The speech sounds can be described on the basis of force of articulation. On the basis of this criteria sounds can be classified as fortis and lenis.

Fortis are the sounds, which are produced with more force. They are also called strong sounds. /p/, /t/, /k/ are Fortis plosives in English. Defining fortis crystal puts:

A term used in the phonetic classification of consonant sounds on the basis of their manner of articulation: it refers to a sound made with a relatively strong degree of muscular effort and breath, force, compared with some other sound (known as Lenis). The distinction between tense and lax is used similarly. The labels 'strong' and 'weak' are sometimes used for the contrast involved, but these are more prone to ambiguity. In English, it is the voiceless consonants (/p/, /t/, /f/ /s/ etc.) which tend to be produced with fortis articulation (their voiced counterparts being relatively weak), and often, when the voicing distinction is reduced, it is only the degree of articulatory strength which maintains a contrast between sounds. The term 'Fortis' is sometimes used loosely to refer to strong vowel articulation also, but this is not a standard practice. (187)

So, it is clear that the aspirated sounds are fortis which need a strong puff of air for their production.

Lenis are the sounds, which are produced with relatively less force. They are also called weak sounds. Regarding plosives, /b/, /d/, /g/ are lenis. Defining lenis crystal says:

A general term used in the phonetic classification of consonant sounds on the basis of their manner of articulation: it refers to a sound made with a relatively weak degree of muscular effort and breath force, compared with some other sound (known as fortis). The distinction between lax and tense is used similarly. The labels 'weak' and 'strong' are sometimes used for the contrast involved but these are more prone to ambiguity. In English it is the voiced consonants ([b], [d], [v], [z] etc.) which tend to be produced with lenis articulation (their voiceless counterparts being relatively strong), and often, when the voicing distinction is reduced, it is only the degree of articulatory strength which maintains a contrast between sounds. The term 'lenis' is sometimes used loosely to refer to weak vowel articulation also, but this is not a standard practice.

(263-264)

From the above definition it is clear that the voiced plosives are lenis. The strong puff of air is not needed for their production. So these sounds are unaspirated sounds.

3.5 Allophonic Variants of English Plosives

A phoneme can be realized differently as they occur in different contexts. Such variants are called allophonic variants. Oxford Advanced Learner's Dictionary describes the allophone as "A sound that is slightly different from another sound although both sounds belong to the same phoneme and the difference does not affect the meaning" (39).

Defining the same term, Crystal says: "Allophony is the term used for cases where a feature does not occur in an inventory, but a context-specific condition overrides the general prohibition"(19).

The above definitions make it clear that a phoneme can be realized differently although it has same meaning.

Aspiration is an allophone in English and the three voiceless plosives /p/, /t/ and /k/ are aspirated. Regarding the aspiration Crystal adds:

A term in phonetics for the audible breath which may accompany a sound's articulation, as when certain types of plosive consonants are released. It is usually symbolized by a small raised /^h/ following the main symbol. In examples such as English pin /p^hin/, the aspiration may be felt by holding the back of the hand close to the mouth while saying the word the contrast with bin, where there is no aspiration, is noticeable. (37)

From the above definitions it is clear that the strong puff of air at the time of release is called aspiration. It can be marked by /h/ just above the phoneme. There is not phonemic change by the aspiration in English.

Regarding the aspiration Gussmann says:

English voiceless plosive consonants- the initial sounds in words like peace, tease, keen - are pronounced with a puff of air called aspirated and transcribed by means of the diacritic [^h] following the plosive: [p^hi: s], [t^hi:2], [k^hi:n]. No aspiration is found when voiceless plosives appear after [s] : as a result we find pairs of very similar consonants: [p^hp], [t^h-t], [k^h-k] (4).

Thus aspiration is a period of voicelessness that follows the holding phase of voiceless stop and is followed by the voicing for the vowel, English consonants /p/, /t/ and /k/, when appear word initially, have a momentary out rush of air with audible noise after the hold stage.

3.5.1 The Allophonic Variants of English Voiceless Plosives

The voiceless English plosives /p/, /t/ /k/ are differently articulated in different ways depending in the environment in which they occur. Gimson shows the following allophonic variants of voiceless plosives.

- i) The voiceless plosives /p/, /t/ /k/ are aspirated when they come as the initial sound in the word and the aspirated /p/, /t/ and /k/ are transcribed by means of the diacritic [^h] following the plosive /p^h/, /t^h/ and /k^h/ respectively. For examples, pan , tap, cat

/p^hæŋ/ /t^hæp / /k^hæp /

- i) When they are followed by the sound /s/, they are not aspirated. For examples: speak, stop, skin.
- iii) When they are followed by nasal consonant they are nasally exploded, for example: top most, button, black man.
- iv) When these sounds are followed by lateral sound /l/, they are articulated laterally. Play, cattle, clean.
- v) There is no audible release of voiceless plosives if they come in word final. For examples: help, pat, sick
- vi) When they are followed by other plosives, they are not clearly audible. out post, captain, black board.
- vii) When /k/ is followed by front vowel, it is palatalized, e.g. keep, key

(157-161)

3.5.2 Allophonic Variants of English Voiced Plosives

Voiced plosives in English are also differently articulated as they occur in different contexts. The sound /b/, /d/ and /g/ which are supposed as voiced plosives, are not voiced everywhere and they have other variants. Gimson shows the following variants of English voiced plosives.

- i) When the voiced plosives /b/, /d/ /g/ come in the word initial position, they are partially devoiced. e.g. bin, dog, game
- ii) They are voiceless in word final. e.g. rub, good, bag

- iii) When /b/ and /d/ are followed by lateral, they are laterally audible. e.g.
apple, middle
- iv) When they are followed by nasal consonant, they are nasally exploded, e.g.
submit, madness, ignore.
- v) When they are followed by another plosive, they are not audible. e.g.
obtain, head boy, big gate.
- vi) The sound /b/ as intervocalic is voiced e.g. rubber, labour
- vii) When /g/ is followed by front vowel, it is palatalized. e.g. give, gift

(157-161)

Chapter-4

Classification of Plosives in Nepali

4.1 Background

Nepali language is rich in plosives. There are oral as well as nasal plosives. Different linguists in Nepali seem to express different views about plosives. The following sounds are considered as plosives in Nepali language:

क,	ख,	ग,	घ,
/k/	/kh/	/g/	/gh/
प,	फ,	ब,	भ,
/p/	/ph/	/b/	/bh/
ट,	ठ,	ड,	ढ,
/t/	/th/	/d/	/dh/
त्,	थ,	द,	ध,
/t/	/th/	/d/	/dh/

Some linguists in Nepali have included म् /m/, न् /n/ and ण् /ŋ/ as plosives. They way the above sounds are produced suggests that they are stop sounds, but Nepali linguists don't describe them as plosives/ stops. They are described as the sounds produced with the touch of the two or more articulators. To them touching is more important than the explosion while describing these sounds. Nepali linguists don't describe them as stop but as the touching sound. They have even included /m/, /n/, /ŋ/ under this category. It proves that they don't describe these sounds as stop plosive but touching sound.

The plosives can be classified on the basis of the place of articulation, the voicing and the aspiration.

4.2 Nepali Plosives on the Basis of Place of Articulation

All the sounds are heard different although the same articulators articulate them. However, we find a lot of similarities among such sounds. The sounds, which are articulated from different organs, are vastly different. Due to this diversity among the sounds, they are classified in different groups on the basis of place of articulation. And Nepali plosives are also classified in different groups on the basis of place of articulation.

4.2.1 Bilabial Plosives:

In Nepali, like in English, bilabial plosives are supposed as articulating with the active participation of the upper and lower lips. Defining the bilabial plosives Nepali linguist Neupane says: “यिनीहरूको उच्चारण दुवै ओठ जोडिएर सास रोकिएर ओठ खुल्दा सास छिरेपछि हुन्छ “ 'Bilabial plosives are articulated when the two lips are closed together and the blocked air goes out suddenly when they are parted' (204-205).

The sounds प् /p/, and ब् /b/ are bilabial plosives in English and Nepali. Besides these the different phonemes फ् /ph/ and भ् /bh/ are also supposed as bilabial plosives in Nepali. These sounds have no counterparts in English. The position of articulators for the production of these sounds is shown in the following figure:

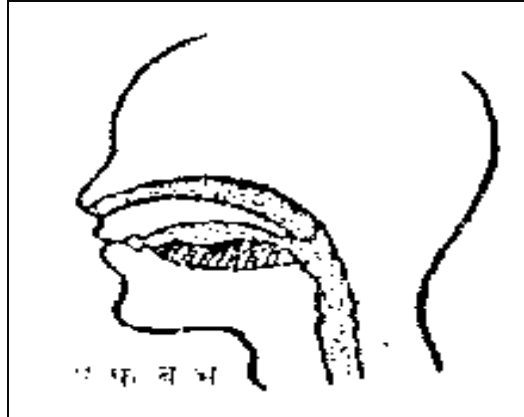


Figure number 13 (Dhakal – 78)

All these sounds are oral stops. For the production of these sounds the air from the lungs is completely blocked in the oral air passage by the lower lip and upper lip and the nasal cavity is blocked by the velic closure at the same time and when the lips are parted the sounds come as an explosion.

4.2.2 Velar Plosives

Nepali language has got more velar plosives than English does. The sounds क् /k/ and ग् /g/ are common sounds for both languages. The Nepali velar stop sounds ख् /kh/ and घ् /gh/ have no counterparts in English. So all together the sounds /क्/ /k/, /ख्/ /kh/, /ग्/ /g/, /घ्/ /gh/ are velar plosives in Nepali. Gautam and Luitel say: “जिब्राको पछिल्लो भागले कोमलतालुलाई छुँदा उच्चरित हुने ध्वनि कण्ठ्यस्पर्शी ध्वनि हुन् ” 'The sounds articulated with the back of the tongue against the velum are called velar sounds' (31). The position of the articulators for the production of these sounds is shown in the following figure.

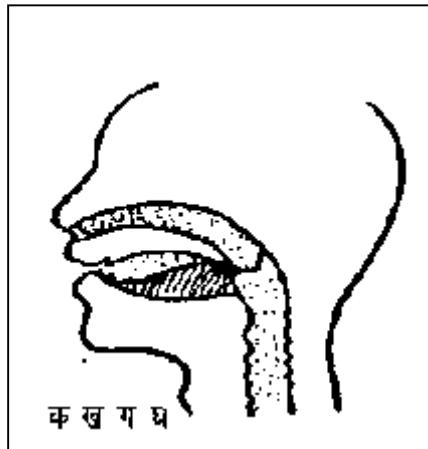


Figure number 14 (Dhakal 77)

All these sounds like English, stops, are oral stops and they are articulated by the active participation of the back of the tongue and the soft palate. These organs block the air from the lungs and when they are parted, the sound comes as an explosion.

4.2.3 Dental Plosives

Unlike in English, there are dental plosives in Nepali. The touch of the tip of the tongue against the upper front teeth articulates these sounds. The tongue is an active articulator. The air in the oral passage is stopped when the tongue touches the upper teeth. With the recession of the tongue the air goes out and the sound is articulated. The positions of organs of speech for the production of these sounds is shown in the following figure:

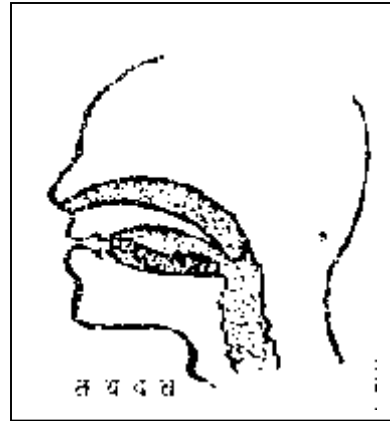


Figure number 15 (Dhakal 78)

The above-mentioned figure shows that the air is blocked by the touch of the tip of the tongue against the upper teeth. When the tip of the tongue is lowered these dental plosives are articulated. Because of velic closure the air escapes through the mouth only. So these sounds are oral stops.

In Nepali the following sounds are considered as the dental plosives

Sounds in Nepali	Transcription in English	Meaning in English
त् /t/ <i>talab</i>	/təlɒb/	(salary)
थ् /th/ <i>thakAi</i>	/θəkai/	(fatigue)
द् /d/ <i>dash</i>	/ðəs/	(ten)
ध् /dh/ <i>dhArA</i>	/d ^h ɑ:ra:/	(tap)

4.2.4 Retroflex Plosives

The retroflex sounds are produced with the tip of the tongue curled back to touch or nearly touch the hard palate at the top of the mouth. In the production of retroflex plosives the tongue functions as an active articulator & the retroflex as

passive. The touch of the tongue against the hard palate blocks the air in the air passage. When the tongue is suddenly lowered, the sound comes rapidly. Defining the retroflex plosives Nepali linguist Gautam and Luitel say: “जिब्राको टुप्पो दोब्रिई मूर्धा स्थानमा छुँदा उच्चरित हुने ध्वनि मूर्धान्यस्पर्शी ध्वनि हुन् ” 'Retroflex plosives are articulated when the tip of the tongue is curled and touches the retroflex' (95).

However the final decision is to be still made about the retroflex plosives, the following sounds are considered as retroflex plosives in Nepali.

/ट/ = /t/ *tamatar* /t̠ma:t̠/ (tomato)

/ठ/ = /th/ *thakkar* /t̠ʰək̠k̠r̠/ (collision)

/ड/ = /d/ *dar* /d̠r̠/ (fear)

/ढ/ = /dh/ *dhakkan* /d̠ʰək̠n̠/ (lid)

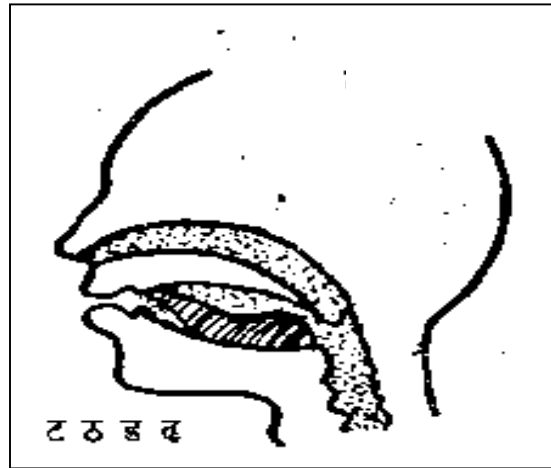


Figure number 16 (Dhakal –77)

In the above figure the curled tongue against the retroflex blocks the air and when they are parted the sounds ट /t/, ठ /th/, ड /d/ and ढ /dh/ are articulated. Because of Velic closure the air escapes through the mouth.

According to the newly grown opinion, but final decision in this regard is still to be made, these sounds are articulated with the active participation of the tongue and alveolar ridge. M. Sharma puts the new opinion as “उपर्युक्त स्पर्शहरु जिह्वाटुप्पोद्वारा वटर्सको स्पर्श हुँदा उच्चरित हुन्छन् । यस सम्बन्धमा अन्तिम दुइको लाग्न बाँकी रहेको देखिन्छ” 'These plosives are articulated when the tip of the tongue touches the alveolar ridge. But the final decision in this regard is to be still made' (9).

4.3 Nepali Plosives on the Basis of Vibration of the Vocal Cords

The vibration of the vocal cords affects the production of the sounds. Differences can be realized due to its vibration. Some of the sounds are articulated with vibration and some without vibration of the vocal cords. On this ground, Nepali has also two types of plosives: Voiced and Voiceless.

4.3.1 Voiced Plosives

The following figure shows the vibration of the vocal cords while articulating voiced sounds. In the figure, the vocal cords are loosely held together. When the air comes from the lungs it vibrates them. Like in English, in Nepali too the plosives, which are articulated with the vibration of the vocal cords, are called voiced plosives.

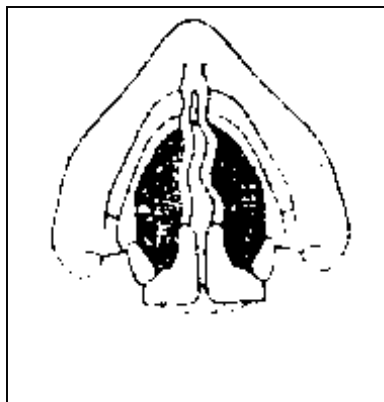


Figure number 17

Defining the voiced sounds Nepali linguists Guatam and Luitel say:

“स्वरचिम्टी आ-आफ्नो ठाउँ छोडी परस्पर नजिकैँदा वायुमार्ग साँगुरिन्छ र फोक्साबाट आएको सासले स्वर चिम्टीलाई दबाव दिन्छ । यस दबावका कारणबाट स्वरचिम्टीमा प्रकम्पन पैदा हुन्छ । यस अवस्थामा घोष ध्वनि उच्चरित हुन्छन् ” 'When the vocal cords are loosely held together the glottis becomes narrower and vibration of the vocal cords occurs when the air from the lungs presses through them. In such condition, the voiced plosives are articulated' (38).

The voiced plosives in Nepali are as follows:

Sounds in Nepali	Transcription	Meaning in English	English Equivalent.	
ब	<i>Bal</i>	/bɔ:l/	power	/b/
भ	<i>Bhara</i>	/b ^h ɔ:r/	fill	/b ^h /
ड	<i>Dara</i>	/ad:r/	fear	/d/
ढ	<i>dhakani</i>	/d ^h ɔ:ka:nI/	lid	/dh/
द	<i>dar</i>	/dɔ:r/	supper	/d/
ध	<i>dhan</i>	/d ^h ɔ:n/	property	/dh/
ग	<i>gar</i>	/ga:r/	do	/g/
घ	<i>ghar</i>	/g ^h a:r/	house	/g ^h /

The sounds /b/, /d/ and /g/ are common in English and Nepali language in many respects. Besides these the sounds /bh/, /dh/ /d/,/dh/ and /gh/ are not found in English language.

4.3.2 Voiceless Plosives

In Nepali also the sounds that are articulated without vibration of the vocal cords are called voiceless plosives. Defining the voiceless sounds Gautam and Luitel say: "स्वरचिम्टीहरू आ-आफ्नो ठाउँमा रहँदा वायुमार्ग साँगुरिँदैन र फोक्साबाट आएको सास सहज रूपमा

प्रवाहित हुन्छ । यसरी सास प्रवाहित हुँदा स्वरचिम्टीमा कुनै दबाव र प्रकम्पन हुँदैन । यस अवस्थामा अघोष ध्वनि उच्चरित हुन्छ" 'When the vocal cords are wide apart in their own places the glottis becomes wide open and the air passes freely. Which causes no vibration of vocal cords. In such situation the voiceless sounds are articulated' (38). The following plosives are voiceless in Nepali.

Sounds in Nepali	Transcription in English	Meaning in English	English Equivalent
क् /k/ <i>kapas</i>	/kəpa:s/	(cotton)	/k/
ख् /kh/ <i>kharaya</i>	/k ^h əra:jo/	(rabbit)	/k ^h / aspirated /k/
ट् /t/ <i>tamatar</i>	/təma:tə/	(tomato)	/t/
ठ् /th/ <i>thakkar</i>	/t ^h əkəkər/	(collision)	/t ^h / aspirated /t/
त् /t/ <i>Tarakari</i>	/tərəkari/	(curry)	/t/ dental
थ् /th/ <i>Thap</i>	/t ^h əp/	(Extra)	/t ^h / dental
प् /p/ <i>Pasal</i>	/pəsəl/	(Shop)	/p/
फ् /ph/ <i>Phalam</i>	/p ^h əla:m/	(Iron)	/p ^h / aspirated /p/

The position of the vocal cords is shown in the following diagram.

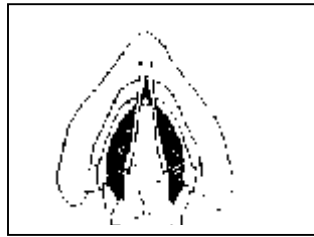


Figure number 18

In the above figure the vocal cords are wide apart. While articulating the sounds क् /k/, ख् /kh/, ट् /t/, ठ् /th/, त् /t/, थ् /th/, प् /p/, and फ् /ph/, and the vocal cords do not vibrate because of wider air passage.

4.4 Nepali Plosives on the Basis of Aspiration

Nepali plosives can also be studied on the basis of aspiration. The quantity of air from the lungs plays important role in the production of the sounds. On this basis, Nepali plosives are divided into aspirated & unaspirated groups. Gautam and Luitel say:

कतिपय ध्वनिको उच्चारणमा फोक्सो बढी खुम्चिन्छ भने कतिपयमा अपेक्षाकृत कम खुम्चिन्छ । फोक्सो अपेक्षाकृत बढी खुम्चिएको बेला फोक्साबाट निस्कने सासको मात्रा बढी हुन्छ भने कम खुम्चिएको बेला सासको मात्रा पनि कम हुन्छ । यी दुवै अवस्थामा ध्वनिहरू उच्चरित हुन्छन् । सबै ध्वनिको उच्चारणमा सासको मात्रा एकनास हुँदैन । कुनै ध्वनिको उच्चारणमा सासको मात्रा घटी हुन्छ र कुनैमा बढी हुन्छ (39) The lungs are narrowed and flattened while articulating the sound. The puff of air will be strong when it is narrowed and will be weak/less at the time of flattened. In both narrowed and flattened situations the sounds are articulated. The puff of air is not equal in production of all the sounds. Some need higher quality and some little.

In Nepali, aspiration is an element, which brings change in the phonemes. Neupane and Bhattarai say: “त्यो स्पष्ट अर्थभेदक तत्व हो प्राणत्व” 'Aspiration is clearly an element that changes meanings' (56).

When they are aspirated they become distinct sounds in Nepali. For instance when क् /k/ is aspirated as /k^h/ it becomes the distinct sound ख् /kh/ which is distinct phoneme. For example *kasam* (anoath) and *Khasam* (husband). So the aspirated and unaspirated series of Nepali plosives are quite different.

4.4.1 Aspirated Plosives

The sounds, which need more quantity of air from the lungs for their production, are called aspirated sounds. Aspiration in Nepali is phonemic but it is only allophonic in English. Neupane and Bhattraï say : “अल्पप्राणका तुलनामा उच्चारण गर्दा बढी सास खर्च हुने व्यतिरेकी ध्वनिहरु छन् , जसलाई महाप्राण भन्नुपर्दछ ” 'In comparison with unaspirated sounds, there are sounds that need more quantity of air for their production. They are called aspirated sounds' (56).

The need of quantity of air for aspirated sounds is supposed to be more than the unaspirated plosives. Such plosives in Nepali are given below.

Sounds in Nepali	English Equivalent
ख् /kh/	/k/ with aspiration
घ् /gh/	/g/ with aspiration
ढ् /dh/	/d/ with aspiration
ट् /th/	/t/ with aspiration
थ् /th/	/t̪/ with aspiration
ध् /dh/	/ð/ with aspiration
फ् /ph/	/p/ with aspiration
भ् /bh/	/b/ with aspiration

4.4.2 Unaspirated Plosives

The plosives, which need comparatively less quantity of air from the lungs for their production, are known as unaspirated plosives. Defining the unaspirated sounds Sharma and Luitel say: “कम मात्रामा श्वासको प्रवाह भई उच्चरित हुने व्यञ्जनलाई अल्पप्राण

व्यञ्जन भनिन्छ, " 'The sound which are articulated with the small quantity of air are called unaspirated sounds' (66). Nepali plosives supposed as unaspirated are as follows:

Sounds in Nepali	English Equivalent
क् /k/	/k/
ग् /g/	/g/
ट् /t/	/t/ (alveolar)
त् /t/	/t/ (dental/
ड् /d/	/ /
प् /p/	/p/
ब् /b/	/b/

4.5 Nepali म् /m/, न् /n/ and ङ् /ŋ/ as Plosives

Some Nepali linguists like Adhikari Hemangraj, Guatam and Luitel claim that the sounds म् /m/, न् /n/ and ङ् /ŋ/ are plosive although they have nasal plosion. They say that having nasal explosion these sounds are articulated by the touch of the articulators each other as it occurs in the production of sounds like /p/, /b/, /g/, /k/ etc. Since plosives are articulated by the touch of the articulatory organs, as deformed by Nepali linguists. So, according to them these sounds are plosives. Defining the plosives Adhikari puts: "कुनै न कुनै उच्चारण स्थानमा छोइएर मात्र उच्चारण हुने वर्णहरूलाई स्पर्श भनिन्छ, " 'Plosives are articulated with the touch of the articulators at any point' (7).

Defining the same term another Nepali linguist Dhakal adds:

नेपाली भाषाका म्, न्, ङ् ध्वनि नासिक्यस्पर्शी व्यञ्जन हुन् । ङ् जिब्रोको पछिल्लो भागले कोमल तालुलाई छुँदा उच्चरित हुन्छ भने जिब्रोको अघिल्लो भागले वर्त्यलाई स्पर्श गर्दा 'न्' को उच्चारण हुन्छ । दुवै ओठ परस्परमा भ्याप्ट टाँसिदा 'म्' उच्चरित हुन्छ। यी तीनवटै व्यञ्जनको उच्चारणमा कलनासो (Uvula) तटस्थ बस्छ, अनि फोक्साबाट आएको हावा धेरै नाक र थोरै मुखतिरबाट निस्कन्छ, (80) The sounds /m/, /n/ and /ŋ/ in Nepali are nasal plosives. The sound /ŋ/ is articulated when the back part of the tongue touches the soft palate where as /n/ is articulated by the front part of the tongue against alveolar ridge. In production of /m/ two lips are brought tightly together. Uvula remains neutrally in case of these three different sounds and the air from the lungs goes out mostly through nasal passage and partly through mouth.

Dhakal has shown the position of the organs of speech. The following diagram shows the positions of organs of speech for the production of ङ् /ŋ/ sound.

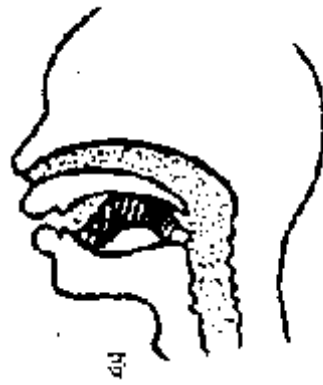


Figure number 19 (Dhakal- 77)

While articulating the sound ङ /ŋ/ the air from the lung is blocked by the back part of the tongue and the soft palate in the oral passage but, the air escapes mostly through nasal passage and partly through the mouth when the articulators are parted.

Since ङ /ŋ/ is articulated with the active participation of back of the tongue and soft palate, it is called velar plosive. The vocal cords remain loosely together so that the air comes with the vibration of vocal cords so it is called as voiced sound.

Similarly the sound न /n/ is articulated with the active participation of tip of the tongue and the alveolar ridge. The air from the lungs is blocked by the tip of the tongue against alveolar ridge in the oral passage but the air escapes partly through the nose when the tongue is lowered the air comes out partly through the mouth as well. There is vibration of the vocal cords. So it is called voiced sound.

Gautam and Luitel have included न /n/ as alveolar plosive. The position of the organs of speech, which Dhakal presents, is shown below:

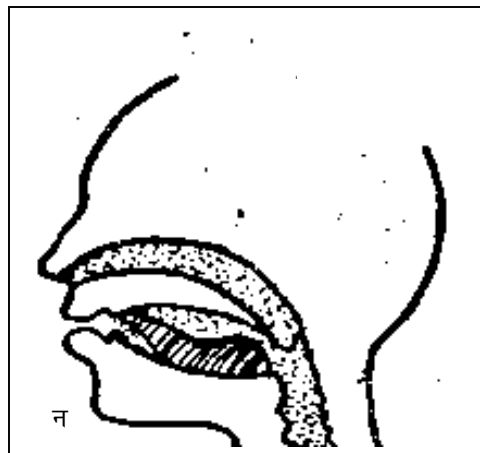


Figure number 20 (Dhakal - 77)

Another nasal plosive sound is ऩ /m/. It is articulated with active participation of two lips. The lips block the air in the oral passage but there is not velic closure. So the air escapes through nose when the lips are open the air comes partly through the mouth as well. The position of organs of speech for the production ऩ /m/ is given below:



Figure number 21 (Dhakal 78)

In the above diagram the lips are closed. There is not velic closure so the air escapes through the nasal passage however the lips play pivotal role for the production of ऩ /m/.

The vocal cords remain closely together. So there is vibration while articulating this sound.

4.6 Allophonic Variants of Nepali Plosives

Like in English a lot of allophonic variants are found in Nepali plosive. But most of the variants are not only phonetic, but also phonemic. Some Nepali sounds in comparison with English sounds are articulated as if they are allophonic variants but they change the meaning of the word so they are not allophonic. E.g.

in English /p/ and /p^h/ sounds are allophonic variants but in Nepali प and फ are different phoneme as they change the meaning.

/pal/ - time /phal/ - fruit

In spite of this fact, Nepali sounds are also realized differently as they occur in different contexts. The sounds in Nepali are also affected by the neighbouring sounds. Regarding it Pokharel Says: “एउटा वर्णभित्र ध्वनि वैज्ञानिक (Phonetic) रूपले फरक फरक प्रकृति भएका विभिन्न ध्वनिहरू समेटिएका हुन्छन् । मातृभाषाका वक्ताले अर्थमा परिवर्तन हुने गरी भएको ध्वनिपरिवर्तनको मात्र वास्ता गर्छन्, लघुतम युग्ममा राख्दा अर्थमा परिवर्तन गर्न नसक्ने ध्वनि परिवर्तनको वास्ता पनि गर्दैनन् । थाहा पनि पाउँदैनन्” 'Phonetically a phoneme contains different phones. The native speakers feel the difference when there is change in the meaning of the sounds and they don't care for the minute change in the sound, which does not change the meaning and they don't even know about it' (2).

He further says: “ कुनै पनि भाषाका वक्ताले वास्ता नगर्ने र थाहा नपाउने ध्वनिपरिवर्तनबाट उच्चारण गरिने ध्वनिहरूलाई एउटै वर्णका बेग्लाबेग्लै संवर्ण (Allophone) भनिन्छ ” 'Allophones are the sounds which are articulated differently but the difference is ignored or unknown by the native speaker' (2).

Similarly Gautam & Luitel add: “एउटै परिवेशमा घटित नहुने र ध्वन्यात्मक विशेषताका रूपमा मिल्दा जुल्दा देखिने वर्णलाई संवर्ण भनिन्छ ” 'The sounds which do not fall in the same contextual occurrence and phonetically they do have similar characteristics are called allophones' (112).

The above-mentioned definitions make it clear that the allophones are the minute change in the articulation of the phoneme, which is hardly noticed by the

listener. The listener feels sameness in their articulation; however, there are a lot of differences. Such allophones do not occur in the same contextual occurrences.

Pokharel talks about the following allophonic variants of Nepali plosives.

- 1) When the alveolar apical sounds ठ /th/, ढ /d/ and ढ /dh/ occur after vowel sounds they will be flapped. e.g.

अठार /ət^har/ हाड /ha:d/ पाडो /pa:do/

In ' ha:d' and 'pa:do' the 'd' sound is not only flapped but also differently pronounced for which there is no nepali letter (symbol) to represent it. Sometimes it is represented by using a dot (.) under 'ड' as in 'ड'. In English this can be represented by using this can be represented by using retroflex /d/.

- But when they are followed by homorganic plosive, they won't be flapped.

e.g. अड्डा /ɔdda:/ लड्डु /lɔddu/

- 2) When Nepali voiced aspirated plosives घ /gh/, ढ /dh/, घ /dh/ and भ /bh/ are preceded by vowel sounds they will be unaspirated.

e.g. बाघ /ba:g/ आधी /a:ɖI/

लोभ /lob/ काँध /kɔ:ɖ/

- 3) The voiceless aspirated plosive sounds ख /kh/ and फ /ph/ will be fricative when they occur after vowel sounds.

e.g. बाफ /ba:f/, साफ /sa:f/, आफू /a:fu:/

- 4) Apical plosives are retroflexed when they occur as Geminates.

e.g. बट्टा /bɔtta:/

अड्डा /ɔdda:/

5) Dental plosives are apicalized before apical sounds

e.g. पात टिप्नु /pat tɪpnu/ = पाट्टिप्नु /pattɪpnu/
सातडोका /sat doka:/ = साड्डोका /sa:ddoka:/

6) Nepali apical plosives are flapped in the postvocalic stage.

खुट्टिकलो [k^hʊtkɪlo] काठको [kʊtko]

7) When the sound ड् /d/ is followed by ल् /l/ it will be lateralized.

e.g. गोड्ला - [godla godla- golla]
काड्ला [kadla - kadla - kalla]

8) The sound ग् /g/ becomes ड् /ŋ/, ड /d/ sometimes becomes retroflex ण /n/,

ब /b/ sometimes becomes म् /m/ and द् /d/ is pronounced as न /n/.

e.g. i) मान्ने /magne = ma:ŋne/
ii) गोडनु /godnu = goŋŋu/
iii) दुब्नु /dubnu = dʊmnʊ/

9) Aspirated plosives become unaspirated before homorganic sounds. e.g.

i) काँध थाप्नु [काँत्थाप्नु]
[ka:d^h t^ha:pnu] [kʊtʰɔ:pnu]

ii) बाफ फैलियो [बाफ्फैल्यो]
[ba:f fəɪljo] [bapfəɪljo]

iii) आठ ठाउँ [आट् ठाउँ]
[a:t^h t^ha...] [a:t^ha:ʊn]

iv) दाख खस्यो [दाक्खस्यो]
[ɔa:k^h k^hasjo] [ɔa:kk^hʊsjo]

- 10) There is voicing harmony when two plosives come together. In such situation either they will be voiced or voiceless. Mostly it is changed according to the later sound. e.g.

टिप्दा [टिप्ता, टिब्दा]

/tɪpɖa:/ /tɪpta: tɪpɖa:/

सातबजे [साद्वजे]

/sa:tbɖdʒe/ /sa:ɖbadʒe/

- 11) When dental plosives are followed by affricate and apical plosive, dental plosives are changed according to the later sound.

पात टिप्नु	[पाट्टिप्नु],	सात चोटे	[साच्चोटे]
[pat tɪpnu]	[pattipnu]	[sat t ^s ote]	[sɔtstote]

[124-163]

Unlike in English nasalization brings change in the meaning of the words.

Some examples in this regard are given below:

वास - /ba:s/ बस्ने ठाउँ = Living place

वाँस - /ba:s/ वनस्पति = a kind of plant

फाट - /fa:t/ छुट्टिनु = separation

फाँट - /fa:t/ सम्म ठाउँ . plain area

Chapter-5

Conclusion

In the present research paper the researcher has explored similarities and differences of the plosives of both English and Nepali languages. In course of the study it is found that Nepali linguists do not have clear-cut idea about the plosives. They have dual concept regarding the sound म् /m/, न् /n/ and ङ् /ŋ/. Gautam and Luitel, Hemangraj Adhikari etc. have included these sounds as plosives whereas Madhav Prasad Pokhrel has included these sounds as nasal sounds.

In Nepali there is lack of detailed study of allophonic variants of Nepali plosives. We can't find detailed description of allophonic variations of individual sounds in Nepali. This research has tried to present the similarities and differences to possible extent.

5.1 Findings

This comparative study between English and Nepali plosives has found out both similarities and differences. I hope that the study is helpful for the Nepali learners who want to learn English plosives but are facing various problems and vice-versa.

5.1.1 Similarities

The origin of English and Nepali Languages is the same. They both belong to Indo-European families. So we find some similarities between the languages.

1. Plosives are found in both English and Nepali languages.

2. Both English and Nepali languages have classified the plosives on the basis of place of articulation, voicing and aspiration. On the basis of place of articulation plosives are sub-classified as bilabial, alveolar and velar plosive. Similarly on the basis of voicing these sounds are classified as voiced and voiceless. And on the basis of aspiration they are classified as aspirated and unaspirated.
3. The sounds /p/, /b/, /k/, /g/, /t/, /d/ are mostly vocally common in both languages.
4. Plosives of both languages are nasalized when they are followed by nasal sounds.
5. Aspirated plosives become unaspirated before homorganic sound in both languages.
6. When the plosives are followed by lateral sound /l/, they will be lateralized.
7. Plosives in English and Nepali are not clearly audible when they are followed by another plosive.
8. Plosive in both English and Nepali language are not clearly audible in word final.
9. There is voicing harmony when two plosives come together in both languages.
10. The release of the first plosive is delayed in cases of gemination in both languages.
11. English and Nepali apical plosives are flapped in the postvocalic stage.

12. The sounds /b/, /d/ /g/ in both languages are unaspirated.

5.1.2 Differences

Although English and Nepali languages both fall in the same Indo-European family, there are a lot of differences between the languages. From the research, the researcher has concluded the following differences of plosives between English and Nepali languages.

1. Aspiration is only allophonic variant in English and there is no difference in meaning. But in Nepali aspiration is not only allophonic variation but it is distinctive feature. e.g.

- | | |
|------------------------------------|-------------------------------------|
| i) गर /gar/ - do | iii) दान /da:n/ - Donation |
| ii) घर /g ^h ar/ - house | iv) धान /d ^h a:n/ - Rice |

We find difference in meaning between /gar/ and /g^har/. The first one tells to do something in Nepali but the second one tells the dwelling place or residence. But in English aspiration does not make difference in meaning.

e.g. pat /p^hæt/ cat /k^hæt/

2. The sounds /t/ and /d/ are alveolar plosives in English but in Nepali there are two sets त् /t/, थ् /th/, द् /d/ and ध् /dh/ as dental set and ट् /t/, ठ् /th/ ड् /d/ and ढ् /dh/ as alveolar set.
3. Nepali has larger number of plosives where as English has only six.
4. Nasalization of the sound brings change in the meaning in Nepali but not in English.

5. Dental plosives in Nepali are apicalized before apical sounds but there is no dental plosive in English
6. When Nepali aspirated plosives घ् /gh/, ढ् /dh/, ध् /dh/ and भ् /bh/ are followed by vowel sound they will be unaspirated but these sounds are not found phonemically in English.
7. Geminates do not occur intramorphemically in English but in Nepali they do occur freely. e.g. /khutta/ 'leg'.
8. English has only one set of voiced stops, the unaspirated set /b/, /d/, /g/, Nepali has two sets, the unaspirated set /b/, /d/, /g/ and the aspirated set /bh/, /dh/, /dh/, /gh/.
9. Nepali voiced plosives are voiced everywhere whereas English voiced plosives are sometimes fully voiced, sometimes partially voiced and sometimes they are devoiced.
10. In the word final position English voiceless stops are usually unreleased where as their Nepali counterparts are usually released.
11. Nepali ढ् /d/ is realized as a flap intervocalically word finally and before a consonant other than a homorganic stop, nasal or lateral: English /d/ does not have such a variant.
12. Plosives are relatively more palatalized in Nepali than in English when they occur preceding a front vowel.
13. In English /m/, /n/ and /ŋ/ are not considered as plosives but in Nepali these sounds are also supposed as plosives.

Regarding the plosive sounds, English linguists are more advanced than Nepali. Sounds have been clearly defined and described in English.

The sound symbols /kh/ for ख, /gh/ for घ, /ph/ for फ, /bh/ for भ, /th/ for ठ, dh for ढ, /t/ for त, /th/ for थ, /d/ for द, /dh/ for ध are not the familiar international sound symbols. So Nepalese linguists should create separate symbols for Nepali phonetic resembling English so that the Nepali phonetics will get its separate identity.

In Nepali the clear-cut idea about the allophonic variants of plosives has not been formed. Some variants have been pointed out but without detailed description. Fixed rules have not been formed yet. The sounds are described focusing to the colloquialism instead of practicality. So the sounds should be categorized scientifically.

Regarding the apico-alveolar plosives in Nepali the final decision has not been made yet. Until and unless the controversy is finalized the study of sounds will be even grater confusion. So the vagueness in this regard should be made clear.

The name of the Nepali plosives is not meaningfully suggestive. They are called *sparsi* (touching) in Nepali. The name suggests that they are the sounds that are articulated by the contact or touch of articulators. Is it enough to define the sounds like क् /k/ , त् /t/ etc. as aspirated ? Do they not need to be described as *visphotak* (explosive) as they are articulated with the complete closure of air passage blocking the air and suddenly parting the articulators to allow the air to

come out with a burst? The Nepali linguists do not give much importance to this manner of articulation but their focus is only to whether sounds are articulated with the touch of articulators or not. Like-wise, the Nepali Linguists Gautam and Luitel, Hemangraj Adhikari etc. are not unanimous about म् /m/ न् /n/ ङ् /ŋ/ keeping them in the category of plosive as well as nasals. क् /k/, प् /p/ त् /t/ etc. This notion is not so sensible because the way प् /p/, त् /t/, क् /k/ etc. and म् /m/ न् /n/ ङ् /ŋ/ are pronounced is quite different except the contact of the articulators involved. For the production of प् /p/ त् /t/ क् /k/ the air released from the lungs is completely blocked for some time somewhere in the oral tract and is released abruptly but in case of the nasal sounds there is no complete closure. Although the articulators make a close contact between them, the air from the lungs is allowed to go out continuously through the nose during the articulation of nasal sounds. So they are not stops.

From the study it has been obvious that the plosive sounds in English and Nepali have very few similarities, so exact translation is impossible.

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Symbols used in the work

Nepali Sounds	Translation	Nepali Word	English Transcription	English Meaning
क्	/k/	कलम	/k ^h ələm/	Pen
ख्	/kh/	खरायो	/khəra:jo/	rabbit
ग्	/g/	गाई	/ga:I/	cow
घ्	/gh/	घर	/g ^h ər/	house
ङ्	/ŋ/	ङ्याउ	/ŋjæ /	mew
ट्	/t/	टाल्नु	/ta:lnu/	Patch
ठ्	/th/	ठाउँ	/t ^h a /	place
ड्	/d/	डमरु	/dəmərʊ/	cub
ढ्	/dh/	ढकनी	/d ^h aka:nI/	lid
त्	/t/	तपाई	/təpaI/	you
थ्	/th/	थान	/ „ a:n/	set
द्	/d/	दरवार	/dədəra:r/	palace
ध्	/dh/	धन	/dhən/	wealth
न्	/n/	नाच	/na:t/	dance
प्	/p/	पढ्नु	/pəd ^h nu/	read
फ्	/ph/	फल	/fəl/	fruit
ब्	/b/	बन	/bən/	jungle
भ्	/bh/	भकुण्डो	/b ^h əkundo/	ball
म्	/m/	मकै	/məkəI/	maize