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A Contrastive Study of English & Hindi Speech Sounds

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Abstract

The prime objective of this study is to make a comparative analysis of speech sounds found in English and Hindi. In doing so, study has used documents analysis to collect required data. Based on the analysis the study reveals several striking facts of which three are worth mentioning here: First, understanding and comparing the variants of sounds in Hindi and English language. Second, understanding the phonological limitations of English speech sounds and ways to overcome them.Third, exploring the missing sounds of Hindi in English language, and of English in Hindi language. This study is useful for the reason that it not only talks about the phonological gaps between English and Hindi speech sounds but also it gives a comprehensive account of phonological description to learn the gap sounds.

Introduction

There are many speakers of English language who want to learn Hindi and vice-versa. This study wants to show the difference between the Hindi and English speech sounds. It provides that insight into two categories namely vowels and consonants, which are main aspects of any phonology. It is not the presence or absence of sounds that makes a difference, but understanding the way in which speech sounds are produced and used in the language that determines whether you have learnt the language right.

Research Objectives

- Exploring phonological gaps between English and Hindi speech sounds.

- Understanding the phonological limitations of English speech sounds and ways to overcome them.

Research Questions

- What are the phonological gaps between Hindi and English phonological sounds?
- What are the phonological limitations of English alphabets and the way to overcome them?

Significance of the study

The significance of this study lies in the fact that it will prove as a ready reference to understand the gap sounds between English and Hindi and it will help English and Hindi speakers to learn the gap sounds in a methodical manner.

Literature Review

There are many works on the phonology of Hindi and English. Also, there are works on theories related to sound change, analyses of speech sound. There are some works that re related to this presented research work. This work is done for highlighting the problem of different pronunciations or phonology of English graphemes. English is a West Germanic language that was first spoken in early medieval England and eventually became a global lingua franca. English has developed over the course of more than 1,400 years. The earliest forms of English, a group of West Germanic dialects brought to Great Britain by Anglo-Saxon settlers in the 5th century, are collectively called Old English. Middle English began in the late 11th century with the Norman conquest of England, this was a period in which English was influenced by French. Early Modern English began in the late 15th century with the introduction of the printing press to London, the printing of the King James Bible. Modern English has been spreading around the world since the 17th century by the worldwide influence of the British Empire and the United States.

Like other Indo-Aryan languages, Hindi is a direct descendant of an early form of Vedic Sanskrit, through Prakrit and Apabhramsa (from Sanskrit Apabhramsa "corrupt"), which emerged in the 7th century. After the arrival of Islamic administrative rule in northern India, Hindi acquired many loanwords from Persian, as well as Arabic. Before the standardization of Hindi on the Delhi dialect, various dialects and languages of the Hindi belt attained prominence through literary standardization, such as Awadhi and Braj Bhasha. Early Hindi literature came about in the 12th and 13th centuries.Modern Standard Hindi is based on the Delhi dialect, the vernacular of Delhi and the surrounding region, which came to replace earlier prestige dialects such as Awadhi, Maithili (sometimes regarded as separate from the Hindi dialect continuum) and Braj.Hindi is written in the Devanagari script. Devanagari consists of 11 vowels and 33 consonants and is written from left to right. Unlike for Sanskrit, Devanagari is not entirely phonetic for Hindi, especially failing to mark schwa dropping in spoken Standard Hindi.

According to Bishnoi, S.(2017)*An Analysis upon phonological comparison between English and Hindi* language, JASRAE we took an idea to how to proceed in this research paper with greater advancement. We also observed a few similarities in the work as compared to that with this research paper.

Methodology

This study is mainly descriptive where previous and related studies are reviewed and presented to reach a view about phonology of Hindi and English language and discuss about faced difficulties in learning grapheme with and without IPA phonemes.

Findings

Phonology

Phonology is the investigation of the sound systems of languages. It is the study of how sounds are organized and used in natural languages. The phonological system of language includes an inventory of sounds and their features and rules which specify how sounds interact with each other. Phonology aim is to study these sounds and discover why this happen. It allows phonologist to discover the different rules for combining different sounds and it also help them to find different rules of various different languages.it is the study of sound patterns and their meanings, both within and across languages. An example of phonology is the study of different sounds and the way they come together to form speech and words - such as the comparison of the sounds of the two "p" sounds in "pop-up." in phonology all productions are the same sound within the language's phoneme inventory, therefore even though every 'p' is produced slightly different every time, the actual sound is the same.

English Phonology

The human vocal apparatus can produce a great variety of sounds. As we study the sounds of English in more detail we need a **way to write these sounds down**. That's what phonetic alphabets are for. here are lots of things to be careful about when doing phonetic transcription. Most important is to **pay attention to the sounds**, and don't be distracted by the spelling. English spelling is **not** designed to faithfully represent the sounds of words and is frequently quite misleading in this respect, so it's best to try to ignore it. For example, a single letter (or combination of letters) "ng" in English spelling can represent two different pronunciations.

- Just a velar nasal [ŋ]
  - singer, hangar
  - Here "ng" is a digraph, like "ch"
- A velar nasal [ŋ] followed by [g]
  - finger, anger
  - Here the two letters represent two sounds, like "nk" in **thinker**

These have to be **distinguished in a correct transcription**, even though the spellings are the same that's a defect of English orthography.

"finger" = [fIŋgr]
"singer" = [sIŋr]
"think" = [θIŋk]

And vowels especially are spelled chaotically -- but in phonetic transcription a particular vowel sound is always written the same way. Some examples:

- sound [i] spelling fee, tea, be, key, thief
- sound [e] spelling say, great, made, prey, Mae
- sound [u] spelling do, food, new, sue, soup, rude
- diphthong [ay] spelling sigh, I, eye, my, hide, lie
- sequence of sounds [si] beginning of word: see, sea, senile, seize, scenic, siege, ceiling, cedar, cease end of word: juicy, glossy

The English alphabet has 26 letters, made up of **consonants** and **vowels.** There are five **vowels** and the rest are all **consonants.**

Vowels-a, e, i, o, u

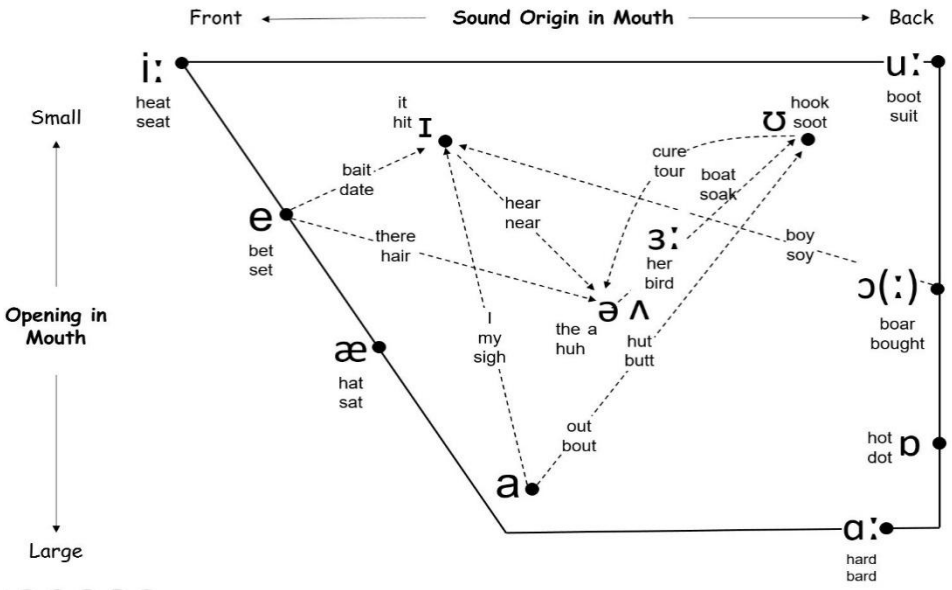
Consonants-b,c,d,f,g,h,j,k,l,m,n,p,q,r,s,t,v,w,x,y,z

The sounds of spoken language are known as **phonemes**. Thus, /water/ has two syllables but four phonemes: w/a/t/er; /inferno/ has three syllables but seven phonemes: i/n/f/e/r/n/o. Do not be fooled into thinking that the each letter has a corresponding phoneme, as in these two examples. A word like /tough/ has two syllables: t/ough and two phonemes: t/ough. In English, the written equivalent of sounds or phonemes are known as **graphemes,** and the English alphabet made up of the 26 letters is called the **orthographic alphabet.** In a language such as English, not all words have a **phoneme/grapheme** match. For example, the words *bough, through and trough* all end *–ough* but each is pronounced differently. English is thus classified as a semi-phonetic language: that is, sometimes graphemes correspond to phonemes, and sometimes they do not. The reason for this is historical, going back to the 17th century and the ways in which written English was standardized. In order to study the sounds of English, linguists devised an alphabet which contains symbols to capture all possible sounds in English, called the **International Phonetic Alphabet.**

The IPA is particularly useful when it comes to describing individual sounds of spoken English. This is because in English there can be more way of pronouncing the same graphemes. For example, in English, there are two main ways of producing the <a> sound: **bath** or **grass** with a long or short.

English has a set of 44 speech sounds. This set of speech sounds is symbolized by the International Phonetics Alphabet or IPA. It includes 24 consonants and 20vowels (12pure+8glide). Vowels can be defined on three parameters namely **tongue-height, tongue advancement, lip-rounding.**

Figure showsTongue position for English Pure Vowel



Glidevowels- As the name suggests, a glide vowel which is made up of two pure vowels changes its quality; e.g. in /ei/ the quality of /e/ changes to /i/.

/uə/ - pure, tour, during
/ei/ - say, they
/əu/ - go, no
/iə/ - peer, year
/ai/ - buy, bite
/oi/ - boy, coin
/au/ - cow, house
/eə/ - fare, bare

All the 24 consonants have been explained below on the basis of voiceless(vl) – voiced(vd), place of articulation, manner of articulation respectively.

Manner⇢	stops	Affricates	Fricatives	Lateral	F.C.	Nasal	Approximant
Place ⇣	VL VD	VL VD	VL VD	VD	VD	VD	VD
Bilabial	/p/ /b/					/m/	/w/
Labio-dental			/f/ /v/				
Dental			/ θ / /ð/				
Alveolar	/t/ /d/		/s/ /z/	/l/		/n/	
Palato-alveolar		/tʃ/ /dʒ/	/ ʃ/ /ʒ/				
Post-alveolar					/r/		
Velar	/k/ /g/					/ŋ/	/j/
Glottal			/h/				

/p/ is voiceless *Bilabial* Stops as it is produced by upper and lower lips and the compressed air from the lungs comes out through the mouth making an explosive sound without vibration in the vocal cords.

/ b/ is voiced *BilabialStops* as it is produced by the upper an lower lips and the compressed air from the lungs comes out through the mouth making an explosive sound with vibration in the vocal cords.

/t/ is voiceless *Alveolar* as it is produced by the tip of the tongue against teeth ridge and the air comes through the mouth making an explosive sound without vibration in the vocal cords.

/d/ is voiced*Alveolar* as it is produced by the tip of the tongue against teeth ridge and the air comes through the mouth making an explosive sound with vibration in the vocal cords.

/k/ is a *voiceless Velar* as it is produced by the back of the tongue against the soft palate and the air comes out through the mouth making an explosive sound without vibration in the vocal cord.

/g// is a *voiced Velar* as it is produced by the back of the tongue against the soft palate and the air comes out through the mouth making an explosive sound with vibration in the vocal cord.

/ʧ/ is *voiceless Palato-alveolar Affricates* as it produces by the blade of the tongue against the teeth ridge and the air is released with audible friction without vibration in the vocal cord.

/ʤ/ is voiced *Palato-alveolar Affricates* as it produces by the blade of the tongue against the teeth ridge and the air is released with audible friction with vibration in the vocal cord.

/f/ is a voiceless *Labio- dentalFricative* as it is produced by the lower lip against upper teeth and the air is released with friction without vibration in the vocal cord.

/v/ / is a voiced *Labio- dentalFricative* as it is produced by the lower lip against upper teeth and the air is released with friction with vibration in the vocal cord.

/θ/ is voiceless *DentalFricative* as it is produced by the tip of the tongue against the upper teeth and the air is released with friction without vibration in the vocal cord.

/ð/is voiced *DentalFricative* as it is produced by the tip of the tongue against the upper teeth and the air is released with friction with vibration in the vocal cord

/s/is voiceless *AlveolarFricatives* as it is produced by tip of the tongue against teeth ridge and the air is released with friction without vibration in the vocal cords.

/z/is voiced *AlveolarFricatives* as it is produced by tip of the tongue against teeth ridge and the air is released with friction with vibration in the vocal cords.

/ʃ/is voiceless *Palato-alveolarFricatives* as it is produced by the blade of the tongue against the teeth ridge and the air is released with frication without vibration in the vocal cords.

/ʒ/is voiced*Palato-alveolarFricatives* as it is produced by the blade of the tongue against the teeth ridge and the air is released with frication with vibration in the vocal cords.

/h/is voiced *GlottalFricatives* as it is produced in the glottis and the air is released with friction with vibration in the vocal cords.

/l/is voiced *Alveolar Lateral* as it is produced by tip of the tongue against teeth ridge and the air is released through the sides of the tongue with vibration in the vocal cords.

/m/is *voiced Bilabial Nasal* as it is produced by upper and lower lips and the compressed air from the lungs comes out through nose with vibration in the vocal cords.

/n/ is *voiced Alveolar Nasal* as it is produced by tip of the tongue against teeth ridge and the compressed air from the lungs comes out through nose with vibration in the vocal cords.

/ŋ/ is *voiced Velar Nasal* as it is produced by the back of the tongue against the soft palate and the compressed air from the lungs comes out through nose with vibration in the vocal cords.

/w/ is *voiced Bilabial Approximant* as it is produced by rounded upper and lower lips and the air is released with mild friction with vibration in the vocal cords.

/r/ is voiced *Post-Alveolar Frictionless Continuant*, as it is produced by rising the tip of the tongue towards the back of the teeth ridge, and the air comes out through the mouth with no friction but with vibration in the vocal cords.

/j/ is voiced *Velar Approximant* as it is produced by the back of the tongue against the soft palate and the air comes out through the mouth without any friction but with vibration in the vocal cords.

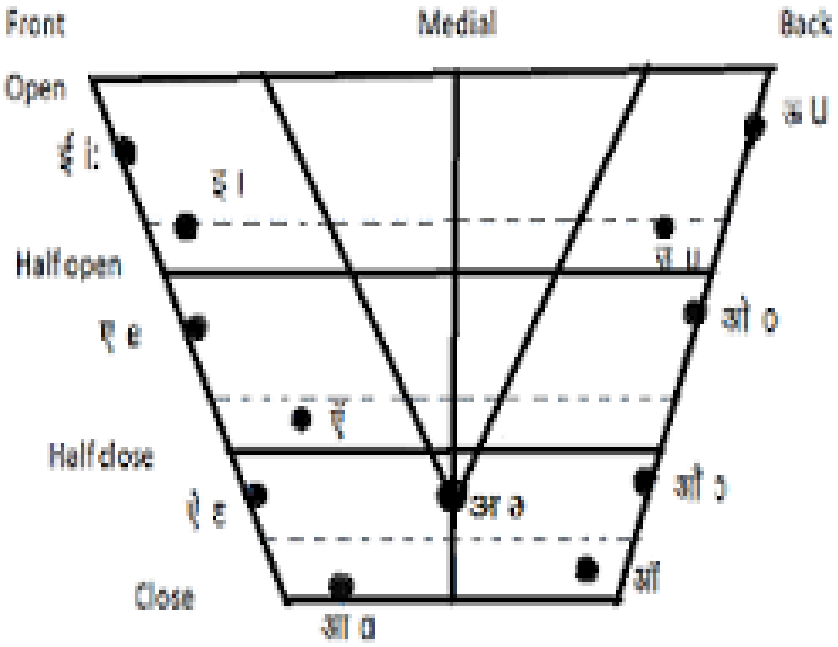
4.3 Hindi Phonology

Phonological analysis of Hindi often concentrates on sounds or itsuses, as a referencepoint,for one or more of the standard accents because it has so many linguistic variants, many other dialects of Hindi are spoken, which have developed independently from these standardized accents, particularly regional dialects. After Mandarin, Spanish and English, Hindi is the most natively spoken language in the world, almost spoken by 260 million people according to Ethnologue, 2014. It is recognized as an official language of India in Devanagari script. Hindi is a direct descendant of Sanskrit through Prakrit (One of the Ancient Indo-Aryan language).

In Hindi, there are total 33 consonants and 12 vowels used for speaking as well as writing. All the vowels have two forms of writing. First one is standalone form. For example, in the Hindi word आम(‘mango’) contains vowel आ‘/a:/’ is being used in the same way as defined. The other one is mātrā form, which worked as a consonant modifier. For example in the word दान (‘donation’) [/d a: n/], vowel आ‘/a:/’ is attached with the consonant द /‘d’/. A complete list of Hindi vowel and consonants is shown below

There are 12 vowels**:** अ आ इ ई उ ऊ ए ऐ ओ औ अं अः

Figure shows Tongue Position for HindiVowels



Hindi Consonants

क ख ग घ ङ

च छ ज झ ञ

ट ठ ड ढ ण

त थ द ध न

प फ ब भ म

य र ल व श ष स ह

33 consonants And 5 more compound alphabets **क्ष त्र ज्ञ ऋ श**

There are 50 consonants in all but one can find 52 in some places as ॐ आॅ are also counted.

Some are made by 2 consonants also, they called 'Sanyuktvyanjan'.

These are-

क्+ष = क्ष

त्+र = त्र

ज्+ञ = ज्ञ

श्+र = श्र

द्+य = द

On the basis of place of origin, and articulation consonants are categorized in the following four categories:

1) velars and Palatals

2) retroflex and dental

3) labial and semivowel

4) Fricatives and retroflex

Consonants are being articulated and amalgamated with vowels by stopping the air moving out of the mouth. Based on this fact of obstruction, the consonants are divided into five groups (वग [[vargas]). These vargas (groups) are ordered according to where the tongue is located in the mouth. As we move forward in the list of consonants groups, the tongue position also moves forward inside the mouth during the articulation. Each group (vargas) has five consonants ordered in a specific way according to how they are realized during the articulation. The members of each group are ordered in the sequence of voiceless unaspirated, voiceless aspirated, voiced unaspirated, voiced aspirated and nasal. The picture below shows all alphabets according to their sounds as per IPA and also categorize each vargas as per their manner and place of articulation.

अ	आ	इ	ई	उ	ऊ	ऋ	ए	ऐ	ओ	औ	Initial Vowels
a	ā	i	ī	u	ū	ṛ	e	ai	o	au	
[ə]	[ɑ]	[ɪ]	[i]	[ʊ]	[u]	[ɻ̩]	[e]	[ɛ]	[o]	[ɔ]	

ऋ is used only in Sanskrit borrowings.

Velars and Palatals

क	ख	ग	घ	ङ	च	छ	ज	झ	ञ
ka	kha	ga	gha	ṅa	ca	cha	ja	jha	ña
[kə]	[kʰə]	[gə]	[gʰə]	[ŋə]	[tʃə]	[tʃʰə]	[dʒə]	[dʒʰə]	[ɲə]

Retroflex and Dental

ट	ठ	ड	ढ	ण	त	थ	द	ध	न
ṭa	ṭha	ḍa	ḍha	ṇa	ta	tha	da	dha	na
[tə]	[tʰə]	[ɖə]	[ɖʰə]	[ɳə]	[tə]	[tʰə]	[də]	[dʰə]	[nə]

Labial and Semivowels (Liquids and Glides)

प	फ	ब	भ	म	य	र	ल	व
pa	pha	ba	bha	ma	ya	ra	la	va
[pə]	[pʰə]	[bə]	[bʰə]	[mə]	[jə]	[rə]	[lə]	[ʋə]

Fricatives and Retroflex Liquids

श	ष	स	ड़	ढ़	ह
śa	ṣa	sa	Ra	Rha	ha
[ʃə]	[ʂə]	[sə]	[ɽə]	[ɽʰə]	[ɦə]

The following characters are used only for non-Sanskrit loanwords:

क़	ख़	ग़	ज़	फ़
ḳa	ḳha	ġa	ja	pha
[qə]	[xə]	[ɣə]	[zə]	[fə]

Missing sound of Hindi in English

Hindi has some sounds that are not there in English. Chief of these are **ज्ञ क्ष ष ण ढ़ घ ध झ** sounds. In English, we don't have the monophthong tense mid vowels **ए***e* [e:] & **ओ***o* [o:]. For English speakers they're more like [eɪ] & [oʊ]. A lot of English speakers don't have a monophthong **औ***au* [ɔ:] either, but they do have it in the diphthong [ɔɪ], which is found in the word 'boy'.

English speakers also don't make a phonological distinction between aspirated and unaspirated voiceless obstruent, thus having difficulty with distinguishing the following pairs: **क***ka* [kə] & **ख***kha* [kʰə], **च***ca* [tʃə] & **छ***cha* [tʃʰə], **त***ta* [t̪ə] & **थ***tha* [t̪ʰə], and **प***pa* [pə] & **फ***pha* [pʰə].

English speakers technically produce all these sounds, but they're not necessarily going to be able to recognize them in the wild. English [h] is technically different from Hindi **ह** *ha* [ɦə]. Don't stress over it unless you need to. In Hindi, the alveolar stops are made with the tongue more forward towards the teeth than in English; that's what the little tooth mark is for in these sounds: **त***ta* [t̪ə] **थ***tha* [t̪ʰə] **द** *da* [d̪ə] **ध***dha* [d̪ʰə]. The difference in placement will make the accent a bit different in the other language, but shouldn't otherwise impede communication.

Finally, in English we don't have any breathy or murmured consonants; breathy or murmured voice is often marked as aspiration on voiced consonants because it acts like voiced aspiration phonologically, but phonetically, "voiced aspiration" is impossible. Murmured voice may also be marked with two dots under the character, like an umlaut that got confused. The murmured

sounds in Hindi are these:
घ *gha* [gʰə] **झ** *jha* [dʒʰə] **ढ** *dha* [ɖʰə] **ध** *dha* [d̪ʰə] **भ** *bha* [bʰə]

Missing sounds of English in Hindi

The English language has sound which doesn't exist in Hindi.Hindi do not have any **click sounds** (like some languages in the southern Africa), or **ejective consonants** like some languages in North America. Hindi also do not have **tone** — a distinction in pitch ("high", "low", "falling", etc.) that could distinguish words. Hindi vowels are just plain, no distinction between **creaky**, **modal**, or **breathy voice.**

Let's start with /v/ and /w/. Hindi has neither. What it actually has a different but similar sounding /ʋ/. You could say /ʋ/ is like the sound between /v/ and /w/. The place of articulation of /ʋ/ is the same as /v/ (labiodental) but the manner of articulation is like /w/ (both are approximant).

V - as in vine, vault, veal, vote.

The sound can be clearly felt to have voice, if you put your fingers on your throat. You should also be able to feel the air being squeezed past your lower lip and upper front teeth indicating that /v/ is a labio-dental, fricative.

Voicing- voiced,

place of articulation- labiodental,

manner of articulation- fricative

ŋ– as in hang, song, thing, singer

This sound is never found at the beginning of a word. it is a **voiced**sound made by the back of the tongue stopping against the soft palate. If you place your finger in front of your nose, you should be able to feel the expulsion of air through your nose, which makes it **nasalconsonant**.

Voicing- voiced,

place of articulation- velar,

manner of articulation- plosive

People talk about how Hindi speakers (and people from South Asia in general) pronounce /v/ as /w/ and vice-versa. Not really. What they actually hear is /ʋ/ which sometimes can sound like /v/ and sometimes like /w/ to English speakers depending on its position in the word.

Hindi does not have the "R" sound of English which is an approximant /ɹ/ (alveolar or postalveolar) although it may occur allophonically. The "R" sound of Hindi is an alveolar tap /ɾ/.

Now let's talk about the famous sounds /θ/ and /ð/. Hindi doesn't have them at all. When you see the digraph "th" in Hindi words written in the Latin alphabet , it actually represents either /t̪ʰ/ or /ʈʰ/. The "th" sound here is an aspirated retroflex stop /ʈʰ/.

The dental fricatives "th-sounds" are not that common in world's languages.

There are some vowels too that Hindi does not have but I will only talk about /æ/ here (the "a" sound in "man") which is a very common vowel in English. Hindi speakers find it extremely hard to differentiate it from /ɛː/ (the "e" sound in "men" but longer) which is what Hindi has. English loanwords with /æ/ are usually borrowed with the vowel /ɛː/ in Hindi.

A great example would be the word *bank* /bæŋk/ which was borrowed into Hindi as बैंक /bɛːŋk/ with the /ɛː/ vowel. Just check a 10 rupee note.

Speech sounds and their behavior in each language is unique. Though the same speech sounds are shared by two languages (Hindi and English) they may not behave the same way. Take this as an example:

The sound /p/ is common to most languages in the world. But its behaviour in English is different from those of Indian languages. /p/ when aspirated (maha prana) as [ph] is Indian languages, it becomes a different sound. Therefore the words *pal* a moment and *phal* a fruit in Hindi are distinct words. In English, this distinction does not exist. The sound /p/ is pronounced with aspiration when it occurs at the beginning of a (stressed) syllable. Therefore, the word 'pen' is pronounced as [phen].

Another example. The English language has a sound which is transcribed as /ʒ/ as in plea*s*ure does not exist in Hindi.

ʒ – as in measure, leisure, seizure

placing your finger over your throat, you can clearly feel the vibration of voice. The position of the tongue is somewhere around where the hard palate and the alveolar ridge meet, making it a palate-alveolar consonant.

Voicing- voiced,

Place of articulation- palate-alveolar,

Manner of articulation- fricative

It is not the presence or absence of sounds that makes a difference, but understanding the way in which speech sounds are produced and used in the language that determines whether you have learnt the language right.

Conclusion

To conclude, the study has attained the set objectives by elaboratingspeech sounds of English and Hindi, and exploring the gap sounds found between them. This study has come up with several striking facts of which three are worth mentioning here: First, understanding and comparing the variants of sounds in Hindi and English language. Second, understanding the phonological limitations of English speech sounds and ways to overcome them.Third, exploring the missing sounds of Hindi in English language, and of English in Hindi language.The scope of future research on the stated theme is wide open and therefore the study further recommends more minute phonological analysis to understand the gap sounds found in English and Hindi.

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