BREAKING THE PHONETIC BARRIER

P. C. GANESHSUNDARAM

Introduction

In this talk I would like to touch upon one aspect of language learning in which we examine the difficulties of pronunciation we come across in learning a second or a third language.

Most of these difficulties of pronunciation stand as a barrier in front of a student.

Such a barrier could be called a 'phonetic barrier'.

The 'phonetic barrier' is characterised by various types of peculiarities in different languages.

I. Types of phonetic peculiarities of languages

1. Some languages exhibit the same sound patterns except for differences in exact phonetic values.

Edward Sapir has described two languages A and B in which the exact sound values are all different, but the distribution patterns are the same.

To this extent they could be considered as two dialects of the same language.

2. Some other languages exhibit slightly different sound patterns and phonetie values. But correspondences could be established between two such languages X and Y.

For example, Tamil and Kannada show the following phonetic correspondences:

TABLE 1

Tamil corresponds to Kannada

p	---------->	**h**
T	--------->	**b**
y	--------->	*z*
pu	---------->	huvu
pal	---------->	halu
pSmbu	---------->	havu
va	---------->	ba
vilai	---------->	bele
peyar	---------->	hesaru
veyil	---------->	bisilu

• This paper was a 'popular lecture' delivered at the Indian Institute of Science, Bangalore, under the 'U.G.C. Extension Lecture Series', on 14-11-1969'.A

Dr P. C. Ganeshsundaram, Deptt. of Foreign Languiges, Indian Institute of Science, Bangalore.

3. Some other languages exhibit similar phonetic Vahies but dissimilar[1] patterns of distribution:

For example:

TABLE 2

1. English	Spanish
/d/* as in *'then'* *(d*)*	as in *'dedo'* 'finger'
can occur anywhere	can occur only between vowels
2. Sanskrit	Tamil
/t/ and (t) can occur anywhere	only initially and when doubled
/d/ both of which can occur	(d) can occur only between vowels and after nasal consonants
Skt. 'danta' /danta/	Tamil 'tandam' /tantam/ [tandam]

II. Interlinguistic interference

Such differences in phonetic patternmeht can cause interference between two languages when a person tries to speak or listen to a second language or a third language.

1. Interference of the mother-tongue when learning a second language:

It is said that Spanish speakers, when learning English, could pronounce the sound *(d*)* correctly in the English word *'together'*, because that is the sound they are accustomed to pronounce between vowels. But they can't pronounce the same sound *(d*)* correctly in the English word *'then'*, because in the initial position they always pronounce (d) and never *(d*)*.

Tamil speakers find it difficult to pronounce (t) in Skt. /kanti/. They can only pronounce it as (kandi), because only (d) can be pronounced by them and not (t) after a nasal consonant. The sound (g) never occurs in the initial position in Tamil and Tamil ears can never detect the presence of aspiration as in the sound (dh). For this reason the word /Gandhi/ is heard and pronounced by a Tamil speaker only as (Kandi).

Thus we see that one of the important prerequisites in the teaching of a foreign language to a native speaker of another language is to study his language pattern-ment and to programme the teaching of the foreign language in such a way as to overcome the interference due to his mother-tongue.

2. Interference between two foreign languages in the case of a speaker who does not know either of these, but who happens to learn both, either together, or one after the other.

Interference is to be expected when we try to learn the following pairs of languages:

• Indicates dental voice fricative in Spanish

Telugu and Kannada
Tamil **and** Malayalam
Hindi and Marathi
Czech and Russian
Russian and Ukrainian
Italian and Spanish
Spanish and Portuguese, and lastly-
British English and American English.

Perhaps the best way for us to avoid an interference between Br. English and Am. English is to cling to our own Indian English. Let us be equally difficult to understand both for the Americans and for the British!

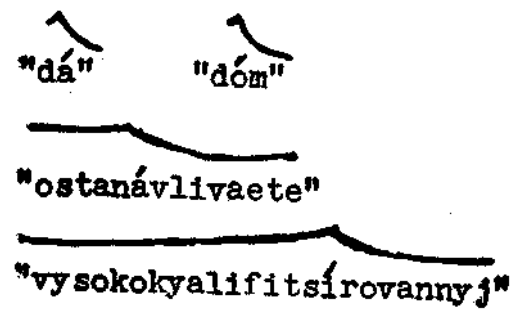
3. Another type of interference is due to the entirely different ways in which whole sequences of sounds are joined together and how they are articulated as a group.

English and Russian are in the habit of stressing one syllable in a word more prominently than others. The psychological length of all the words is felt to be the same so long as each word contains only one stress peak.

Consider the English sequence:

Whatever be the number of words that we are habituated to identify in this sequence from print, there are only three prominent peaks of stress in it and the psychological distance between successive peaks is a constant.

Similarly the words:



are of equal length, psychologically.

As against this we have languages that are more democratic in their treatment of syllables. They consider all syllables to be equal in status, and stress them uniformly, in theory and practice.

The 'stress-peak' languages tend to drop many unstressed syllabic vowels and to fuse the remaining consonants into clusters. The clusters in English and Russian which prove to be tongue twisters for syllabic language speakers are typified in Table III.

TABLE III

Clusters in English and Russian

Clusters	English	Russian
st-	star	staryj
str-	strong	strojnyj
sp-	spot	sputnik
spr-	spring	spravo
spl-	split	splosh
kl-	climb	klastj
ski-	—	sklonenie
kr-	crash	kraska
skr-	screw	skromnyj
zd-	—	zdanie
zdr-	—	zdravsvyjte
vst-	—	vstatj
vzgl-(vzglj-)	—	vzgljad

The syllabic languages on the other hand tend to break up clusters by introducing syllabic vowels between the different consonants in the clusters, even when foreign words are pronounced by speakers of these languages.

Can you recognise the Japanese words 'o-ku-su-ho-ru-do' and 'gu-re-tsu tsu-ra-bu-ru' as anything known to you?

Table IV shows you what they are:

TABLE IV

Japanese pronunciation	of the	English word
O-ku-su-ho-o-ru-do (7)	Oxford (2)	
Gu-re-tsu tsu-ra-bu-ru (3,4)	Great trouble (1, 2)	
Tamil pronunciation	of the	Sanskrit word
Sa-mis-ki-ru-tam (5)	Sarhskrtam (3)	
Pi-ra-ki-ru-tam (5)	Prakrtam (3)	

(The numbers in brackets indicate the number of syllables in each word).

Such interlinguistic interferences add to the difficulty of learning a second language. The later one learns a second language in one's life, the stronger is this interference. There can be no break-through into the second language for the late admissions!

Such is the firmness of the phonetic barrier built into the nervous system of the language learner.

III. Why is there then such a phonetic barrier?

The answer to this question depends on various factors which we may not have time to examine here in detail. But a general superficial survey could now be made.

1. The fundamental fact is that language i s not a purely natural phenomenon, but is a set of acquired habits.

2. When any living organism develops in its particular environment, it reacts with the environment and builds up a certain number of repetitive patterns of behaviour which are slowly and steadily built into its nervous system. In the case of the lower animals this built-in behaviour pattern of its nervous system is almost predetermined so long as the environment is not radically altered. When the environment is altered, the primary motivations of food seeking, preservation of the organism, its reproduction, etc., bring about an adaptation of its behaviour patterns to the new conditions. If it does not, or is not able to, adapt itself, the organism perishes.

The same is true of man and his adaptation to his surroundings.

3. In the case of man, however, there is another dimension of behaviour, in addition to, and superimposed on, those associated with the primary motivations.

This dimension, present in a rudimentary way among the higher animals closest to man, is that of living not as an individual, but as a member of a society. Man as an individual is a weak animal compared with a tiger, a lion or an elephant. But as a group, even under primitive conditions without tools or arms, he is more powerful.

In order to live harmoniously as a member of a society man has to communicate with his fellow man.

Skipping some of the possible stages in the development of communicational behaviour from the earliest pre-stone-age man to the present-day man, let us identify the ways in which man communicates with man, as follows:

(1) By the very way he lives: the ways of finding food, the ways of processing his food, the ways of taking his food, the ways of protecting himself from the elements, leading to the techniques of building shelters, huts, houses and townships.

(2) The ways of reacting to common dangers from the elements as well as from other living creatures including other groups or societies of men.

(3) The ways in which information (as to how the others in his society should identify themselves as members of their society and should act or react appropriately) is communicated to one another by gestures, cries and other more complicated symbolic verbal and non-verbal behaviour.

(4) Finally, the verbal behaviour itself and its codification into a language as a full-fledged symbolic system.

4. If we consider the way in which this symbolic linguistic system of verbal behaviour is developed in human society through an evolutionary process, we can very well see how intimate this symbolic system is to the totality of behaviour patterns of the nervous system of man.

5. When men belonging to different societies have the same basic elements of behaviour such as:

1) trying to live harmoniously as members of a society,

(2) reacting through gestures or cries,

(3) communicating through gestures and through verbal messages,

the question arises as to why men using one language for their communication cannot easily respond to men using another language? In short, the question already asked, but not yet answered is, to repeat: why is there then a 'phonetic barrier'?

IV. The question is one of habituation

Just as we have the environment made up of the elements, we have also an additional environment made up of the social structure and linguistic structure affecting man in his behaviour.

For example, one set of men, eating cooked rice and vegetables, are expected by their own society to take such food from a plantain leaf. In doing so, they are expected by their society to use only their right hand.

In addition, one such society A expects its members to mix their rice and vegetables with their palm and fingers, without touching the food by the back portion of the hand.

Another such society B expects its members to mix their rice and vegetables with the tips of their fingers. It is not good breeding for them to touch the food even by the palm of their hands.

Society A had probably to grapple with a hard variety of cooked rice, whereas Society B had a sticky variety of rice that they had to avoid touching, if they could help it, so that their fingers did not get glued to one another.

With this background when these Societies began to handle rice of the opposite variety, their original habits did not leave them. Society A was prepared to glue its fingers ?nd Society B had to struggle with the newly found hard rice with the tips of their fingers.

In this discussion we have started with the vegetarian end of the spectrum.

What about a Society C, consuming non-vegetarian stuff with gusto?

This Society has to eat the meat but has to throw the bones away. It could do it, most conveniently, by holding the whole lump of meat in both the hands and biting off the—for them—edible portions to advantage.

As against this, a technologically more advanced non-vegetarian Society D in a cold climate, with no hot water ready at hand, would like to remove the bone

from the meat by using a knife and a fork. Washing a soiled hand with freezing cold water could thus be avoided. Cutting the meat with a kinfe and a fork requires the use of both the hands as against the vegetarian societies.

Now we can see that, in order to learn technology (of course for other than eating purposes) a member of a vegetarian society sometimes finds himself in the midst of the technologically advanced non-vegetarian society.

Such a vegetarian in a non-vegetarian milieu meets with many problems:

Problem No. 1: To eat or not to eat meat.

If he decided to eat meat, then:

Problem No. 2: To use the left hand or not to use it.

If he decides to use only the right hand as a true member of his own society, he again has:

Problem No. 3: To bite off a bit of meat held in his right hand or not to bite it off. (It must be noted here that his society does not permit him to bite off bits like that. Small bits have to be torn off with his ringers on the surface of his plantain leaf (or at worst of his plate) before he takes it up for delicate delivery to his mouth).

These are problems that bring forth an emotional upheaval in a member of Society A or B finding himself in Society D.

His habituation to one type of behaviour is so strong that any deviation, he fears, is a disaster for him.

V. We are now in a position to come back to the 'phonetic barrier' which has basically the same causes as the 'food consumption barrier'.

If the ear is trained to hearing syllables after syllables and is trained from birth to ignore variations of stress, a stress dominated language is a hard nut to crack for the syllable-oriented listener.

He cannot get rid of the impression that the speaker of the stress-oriented language 'barks at intervals and mumbles in between'.

He can hear only 'tic' and 'int' when an English speaker says:

All else in this sequence is at best 'barely audible mumble' or at worst 'mere reflex movements of adjusting the vocal organs before and after the exertion of stress'.

Similarly, the equally stressed or stressless syllables of the syllabic language speaker are beyond the capacity of the hearing mechanism of a stress-oriented listener.

He, in his turn, is at a loss to know where a word begins or ends, or whether there are any words at all in the syllable dominated language, or whether it is all just one long monotony, drawled off in slumber.

He finds this language as difficult as a member of Society D would do in trying to eat soup or *rasam* out of a plantain leaf. The *rasam* or soup is ever trying to run out of the plantain leaf and threatens to soak his woollen suit. To save the woollen suit, he has to think fast and try to suck in the soup without the use of his, for the moment, useless hands.

In short, instead of being able to understand, or even catch the syllables of the syllabic speaker, the stress-oriented man is engaged in thinking of ways and means for a quick escape into his own Society, in spite of all the stresses and strains inherent in it.

VI. Let us now take a few concrete phonetic examples

TABLE V

English	Sanskrit	Tamil
(ph)pill	(p)palam'straw'	(p)pal'tooth'
	(p^{h}) phalam 'fruit'	palam 'a unit of wt.'
(b)bill	(b)balam 'strength'	palam./palan 'fruit'
	(bh) bhallaka 'a bear'	palam/balam 'strength'

English initial /p/ is always aspirated and pronounced as (ph). So to an untrained English ear a Sanskrit (p) often sounds like (b) in the initial position. Similarly a Sanskrit (bh) in the initial position sounds like a (p) to an English listener, phonetically untrained.

For the untrained ear of the Tamil speaker, not exposed to any other language, all the varieties of English and Sanskrit (p), (ph), (b) and (bh) in the initial position sound alike. He cannot make out the difference, because he is listening to all these sounds through the filter of the Tamil system of sound patternment. In the initial position he is habituated to ignore all superimposed features of sound other than the explosion of air produced by the sudden parting of the lips. Let us examine Figure 4 and Table V to know what exactly happens:

TABLB VI

Type of initial sound	Place: lips	Suddenness of the parting of lips	Vibration of the vocal cords	Frictional turbulent flow of air at the vocal cords
(P)	+	+	—	—
(ph)	+	+	—	+
(b)	+	+	+	—
(bh)	+	+	+	+
			Ignored by English	
			Ignored by Tamil	

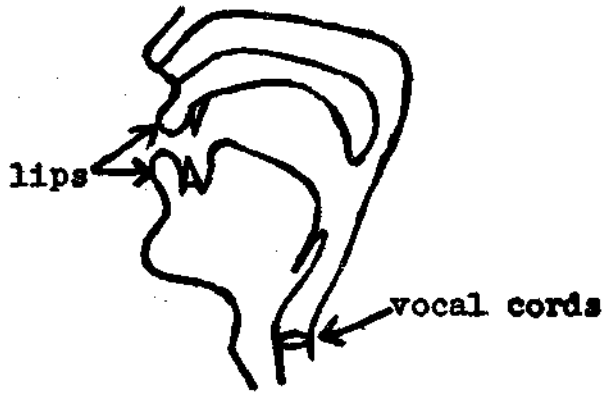


Table V shows all the component features of the different phonetic values of the sounds examined.

Sanskrit does not ignore any of these features. In fact it makes full use of these feature differences for identifying different sounds.

English ignores the last column and Tamil the last two.

An English speaking listener (of course phonetically untrained and un-exposed to other languages) is deaf to aspiration (friction at the vocal cords). A similarly conditioned Tamil speaking listener is deaf toaspiration andto voicing (vocal cord vibrations), when these sounds are heard by him.

This is in fact the 'phonetic barrier' we have been talking about.

VII. Breaking the 'phonetic barrier'

Such phonetic barriers are built up within the system of responses of our nervous systems from early childhood in a gradual way until they become very strong barriers with age.

If a second or a third language has to be taught to someone, we must see that he doesn't have to break such a solid barrier. That is we must teach him the second or the third language before the barrier is built. In other words, early childhood is the best time when languages could be taught with advantage.

If a child were sent to an English speaking kindergarten in the morning, a Kannada speaking kindergarten in the forenoon, a Tamil speaking kindergarten in the afternoon and a Malayalam speaking kindergarten in the evening, before the child's mother returning from work at the BEL, HMT or IISc takes it home for the night, the child would be fluent in all the four languages. If the mother speaks to the child at night in Telugu or Hindi during this time, it would have a fifth language at its command.

If the second language or the third language is taught late at school or later still at the college or university, we can well imagine the nervous exhaustion of the student in trying to break the barrier which is already strongly established by this time.

We see then that:

(1) Every language is difficult to learn if it is taught late in one's life.

(2) No language is difficult to learn if it is taught early enough in childhood.

Still in this modern technological world we have to learn new languages as and when the need arises, even if such a need arises late in life.

We are therefore constrained to develop systematic methods of breaking the phonetic barrier.

This could be done by carefully prepared phonetic drills administered to the students at a phonetics laboratory and a language laboratory, so that the students could be trained to recognise and identify various sound quality differences in their own languages as well as in those they are engaged in learning.

VIII. The ear as a phonetic transducer

We could think of such retraining, because the ear is a peculiar instrument that is highly sensitive and selective in its perceptual functioning.

All the noises of the world are impinging on it all the 24 hours of the day.

When you are listening surreptitiously to a popular play-back artiste like Lata Mangeshkar from your mini-transistor radio, which you may be hiding in your pocket at this very moment, my speech will be felt by your hearing mechanism to be an interfering, undesirable and jarring noise.

Your neighbour on the left may be interested in listening to me and, to him, your mini-transistor will be an undesirable interference.

We can also think of your neighbour on the right. He finds himself in a conflicting situation. He wants to listen to me. That's why he has come here. But your mini-transistor is demanding his equal attention. A tension builds up in him. His concentration fails him and he would be glad to have a coffee break to relieve the tension, at this moment associated with the auditory nerves.

Except in such a conflicting situation or in a situation in which there is the interfering signal of higher intensity, the ear is capable of paying attention to only what it wants.

For example, when I am silently reading or writing at my office desk, I am never aware of how many times during that interval the wind-tunnel at the Aeronautical Engineering Department 'blows up' or 'blows over'. I do not know if these are the exact technical terms to describe the process, but it nevertheless

expresses the interference potential of the noise the tunnel produces. However, when I am in the class room trying to discuss with my students, the shortest 'blow up' is felt to be an eternal interference, both by me and my students.

If we look at or examine the general auditory land-scape around us, we are struck by the fact that there are many sounds in nature we normally ignore all the 24 hours of the day. But if we want to listen to them, we are capable of making our ears concentrate on them, one by one or all at the same time. These are the sounds that we are likely to hear: the song of the mosquito without which Bangalore is not Bangalore, the cricket calling its mate, the frog announcing its presence in a nearby pond, the distant rumble of a loaded lorry, the scarcely audible puffing and panting of a locomotive in a far away railway yard, the slow and steady breathing of your child, sound asleep by your side and even the sound of your own heart beats, heard through the blood vessels nearest to Your ears, often made more pronounced after a dose of medicine from our dispensary.

The phonetic barriers we have built up are thus a result of the negative instructions we have been accustomed to give our ears not to listen to this or that sound, but only to listen to what your narrow attention wants at the moment.

IX. The last question connected with the phonetic barrier, I would like to deal with today, is that of the problem of teaching a language to the deaf.

Those who are deaf from birth are not aware of the existence of a mother-tongue, leave alone a second language. They are often not aware of different types of sounds distinct from one another. For them there is only a continuous background noise, the presence of which is not felt because it is always there and can never be contrasted with anything else to know the difference.

The problem in their case is to break the 'sonic barrier' before we can hope to break the 'phonetic barrier'.

In a large number of cases among the deaf-and-dumb, the dumbness is entirely the result of deafness. In many cases a hearing aid helps to break the 'sonic barrier' to some extent. The wearer of the hearing aid begins to be aware of sound. But he does not possess the ability of discrimination.

Discriminatory ability for the perception of different sounds develops in a normal child from the very first month after birth.

However, a deaf-and-dumb child is identified as such only when he is more than a year old . It is already too late for him to acquire the discriminatory ability by himself, even if he is now made to wear a hearing aid, for that natural process had no chance for development during the first one or two years and is all but lost.

One has to train the child wearing a hearing aid to see the objects and identify the sounds they make: ringing of a bell, beating of a drum, the sound made by a bouncing ball, the sound produced when a piece of paper is crumpled into a

ball, and so on, one by one, step by step, patiently and repeatedly until the child begins to identify the sound even when the object producing the sound is not in front of his eyes.

The next stage is the recognition of the vowel sounds, later the consonant sounds.

After this the child is made to utter the vowels. You must hear the child doing it. What a hard time it is to produce even the simple vowel (a) when your ear has cheated you from birth'!

X. In general, even in the case of people born with their hearing mechanism intact, the building up of a phonetic barrier is the result of isolation due to a narrow adherence to one linguistic and social group.

Breaking the phonetic barrier is just a funny experience for a wealthy tourist in a foreign land.

It is a professional necessity for a technical man learning technical know-how at a foreign institution.

It is a social necessity and humanitarian duty in the case of the deaf-and-dumb children whose only handicap is deafness but who are otherwise as intelligent as other children around them.