INTRODUCTION

"No analysis or mode of analysis is
the only one accurate or sacrosanct
but any account of the language in
any terms is an adequate statement
and analysis, provided that, and to
the extent to which, it comprehen-
sively and economically explains
what is heard (read) in the language
and "Renews" connections with further
experience on it.

(Firth's adaptation of a
passage in James B. Conant's
'Science and Common Sense')

## Introduction

0.1 It is the fact that one begins by introducing the work
after one has completed it and this introduction is not an
exception to this fact. This dissertation has intended to
study some issues of Gujarati phonology. Gujarati language
is one of the important western IA languages. Gujaratis are
a commerce community. The history of their trade with the
west goes back to more than one thousand years. Being the
most mobile community Gujaratis were the earliest Indian
settlers found all over the world even before the moderniza-
tion or colonialization ca me. This naturally resulted into
varieties of dialects. More over the adjustable temperament
of the people have always attracted outsiders to come and
settle in Gujarat. The Iranian Zoroastrians have settled
here for about a thousand years adapting the Gujarati language
and making it their own - thus creating a new dialect. They
have contributed considerably to Gujarati journalism and
literature. Social groups and subgroups due to ethnic, caste,
profession and economic differences provide with many highly
enticing dialect phonologies.

Gujarati speaker has in general no language awareness.
A kind of naivete about their language prevails even
amongst the majority of educated speakers. Speakers having
any academic interest in language are rare to come by
(and rarer still are those who sustain such interest.) In
this sense Gujarati is a neglected language.

0.2  This dissertation intends to study a few salient
features of one of the standard dialects. The work began
by collection of the phonic substance of the language. No
predecided, prefixed theory or the methological frame was
considered as a model. It would be reckless as well as
counter-productive to limit our research strategies in
advance. The ideas and methods were allowed to be moulded
and remoulded in the course of work. The only predecided
part of this study was to stress the importance of phonetics
in phonology and also to give enough weightage to perception
of the language users; Because the most changeable,
flexible and adaptable yet the least noticeable part of the
language is its sounds. From one person to the other, from
one social group to the other and from one place to the
other sounds vary: resulting into multifariously prolifera-
ted variations. These variations at the production end and
the phonemes at the perception end are irresistably
challenging topics in the field of phonology. If people
hear as well as speak then perceptual facts as well as
articulatory ones have a place in phonology.

From more than fifty years the phonologists have tried
to arrive at the methodology for describing the sound
system but in the last few years it is realized that
phonology would have to include much more than is commonly
included. This 'much more' certainly means giving
sufficient importance to the phonic substance (and the
phonetics) of the language.

To study the phonic aspects of language and to describe
the phonological systems from that is problematic and
difficult. This problem is compared with the problem that
cultural anthropology has overcome viz. the problem of the
relationship between nature and culture. This relationship
has to be determined and "it is a priori certain that any
solution which attempts to deprive the problem of this
relational character by excluding one of the two relata is
doomed."[1] In the post-standard-theory period there have been
many proposals which would want to take care of this
'relationship'. It is very well accepted that giving phonemic
inventories and establishing relations between the underlying
and surface phonemes is not enough.

0.3 Having no prior model for this dissertation, the study
of the data has a kind of freedom which may to a certain
extent appear methodologyless search. We have risked that
accusation with the hope that we may make a fresh beginning
in understanding of the Gujarati phonology. Little that has
been done in this area provides us the background for the
selection of the topics in this dissertation. We have tried
to reject objectively some of the earlier observations and
the study includes the evaluation of the past conclusions.

This dissertation has concentrated only on some aspects
of the vowel phonology - the specific features of Gujarati
vowel system compelled us to do so. In this sense the area
covered is narrowed down but in the other sense it has been

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[1] Mol and Uhlenbeck, 1959

expanded because we have tried to explore into greater depth.
To give a complete phonemic inventory was never the aim of
this work. From the beginning the intention was to study some
of the peculiarities of the vowels. "Unlike consonants which
consists essentially of interruptions in the speech stream
vowels are the continuing or sustaining or sounding elements
of speech."[2]

This feature of vowels makes them vulnerable to
prosodies. Speech has its own musical score ranging from
definite articules to laryngeal prosidies; and it is vowels
which have the capacity to carry these prosidies because they
have 'voice'. They display 'optimal manifestation' of voice.
This quality creates the vocalic continuum and makes the
speech audible. The murmur prosody in Gujarati is the most
interesting peculiarity of such continuum. This study begins
with the chapter on murmur.

0.4 It was noted that almost 50% of the Gujarati speakers
speak with a kind of phonation which automatically inhibits
murmuredness.

It becomes obligatory to provide some evidence showing
the difference between the two phonation types. We have
provided a few tomograms for this. However, we regret that
in absence of all the sophisticated techniques[3] we cannot

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[2] Donegan, 1978, p. 26.

[3] Ewan, (1976)- Studied small movements with the help of
photocell-computer tracking technique. He could measure
vertical movement of larynx in 2 mm steps and anterior
posterior movement in fractions of mm.

extend any further investigation. The tomograms show the difference in the laryngeal muscle adjustments for different phonations. The old belief that differences of 'voice quality' or phonation type are matters of 'emotional expression' or 'individual peculiarity' no longer is valid. In the first chapter as well as in the subsequent chapters it is shown that 'phonation types' of Gujarati speech cannot be ignored. Nonetheless a question can be posed as to how such phonation difference can be crucial to phonological description. Phonetically (and theoretically) linguists have accepted Ladefoged's glottal stricture scale.[4] But Henderson fears that it is too early to consider all phonation types as 'phonological features' because by using them as 'cover features'[5] our ignorance regarding physical parameters may be masked.[6] (Gregerson also warns us against setting up of new phonological features because 'from a phonemic point of view any set of terms may serve to designate that $A \neq B$'.[7] We must investigate throughly into what is <u>actually happening</u> in the language.

Murmur and tight phonation may appear linguistically non-relevant or non-functional. But we are able to give some evidence which can show that both the phonations play a significant role in moulding the phonology. These phonations

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[4]. Ladefoged, 1971

[5]. Vennemann and Ladefoged, 1973

[6]. Henderson, 1968

[7]. Gregerson, 1973

affect the mid-vowel lowering differently and also cause various manifestations of the nasality element. Phonation differences act as controlling and moulding forces for the phonology. An interesting observation should be noted at this point: murmur dialects spirantize voiced stops in intervocalic position. Tight phonation which has inherent tensing does not allow such weakening process. In the third chapter we have noted that fortisness-tensing - associated with the tight phonation-develops strong nasality in vowels. As a result there is no trace of denasalization process any where (which has already begun in murmur dialects). These two phonations represent two processes:  murmur $\longrightarrow$ lenition

tight $\longrightarrow$ fortition.

The tenseness of tight phonation acts as a preserving and balancing factor by retaining the stopness of the voiced stops i.e. by not allowing the contrast to develop between spirantized sounds and other stops and by retaining the nasal vowels. The laxness of murmur phonation on the other hand acts like a fluid process, ready to substitute, change and adapt itself in the contexts. Thus both the phonation types work hand in hand in the most wonderful manner retaining - substituting, preserving - effacing and yet balancing the phonemic inventory of the language.

In this sense we have to accept that these phonation types are the relevant linguistic features as if 'purpose-built'. Murmur dialect speakers who are the victims of

laxness - lenition process - deoralize 'h', spirantize stops
and denasalize nasal vowels. Tight dialect speakers are as
if holding and pulling the reins of phonological frame. These
phonations throw light on different streams of diachronic
developments too.

0.5 The issue of Gujarati having six vowels or eight vowels
is discussed in chapter II. The variations in mid-vowels pose
a theoretical question such as when does a phonetic feature
serve as a contrastive feature phonemically. If the lowering
of the mid vowels 'e-o' in Gujarati shows various degrees of
lowering then can we consider such 'lowness' as binary?
Lindau does not see any justification for regarding any
single parameter as a composite of binary features.[8] In
describing phonological processes the use of binary features
to express movements along a single parameter amounts to a
wrong claim about relationships between vowels.[9] Lindau
demonstrated how feature of height is multivalued and that
the points for each value of height need not be contrastive.
The different manifestations of Gujarati mid-vowels have
been shown as the results of the 'one-step-lower' movements in
each defined context. We have shown that even the
diachronically developed lower-mid vowels follow this 'one-
step-lower' criterion. The contextual lowering is a natural
process found in many languages.

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[8]. Lindau, 1978

[9]. Ladefoged, 1971

The degree of lowering varies sociolinguistically (giving vulgarized lowering) and dialectally too. All this 'amorphous mass' of lowered variety of mid vowels perceptually give us only two mid-vowel phonemes i.e. /e/, /o/.[10]

0.6 Another pertinent feature of Gujarati vowels is nasalization. It is an asegmental process and has various manifestations. Nasalization is a complex process comprising nasal assimilation, (homorganic nasal + consonant), glidal insertion with nasalized vowel, nasal effacement and vowel tensing - strengthening. Nasalized vowel after tensing may get lowered and/or diphthongized dialectally. The sonority of vowels create a nasal spread syllabically calling for an asegmental treatment. Homorganic nasal + consonant sequences create one interesting theoretical issue of clusters. We have asserted that 'nasal + consonant' sequence is a homogenous cluster, if both the components are homorganic. The various nasality manifestations show that the sound change is in progress.

0.7 The dynamicity of processes (in the moving) such as murmur, lowering of the vowels and nasalization would mean that we have to ask two questions. (These are pertinent

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10. We have also noted the fact that there is no nasalized [ẽ] to be found in any of the dialects because when nasalized it is lowered. Gujarati and Bengali nasalized mid-vowel is [ɛ̃] in onomatopoetic words. Yoruba supports this observation. Doke has called it "extra-grammatical phonetics of onomatopoeia". (Doke. 1936).

diachronically as well as sychronically.)

1) what happens to the sounds?

2) why it happens?

As Lass says the questions of type (1) are more matters of fact but questions of type (2) involve matters of theoretical interest and are extremely complex.[11] Answers to them depend on how well we know the answers to type (1) questions. We have atleast made a small beginning in this direction by trying to show that these answers to question (1) type can be well answered by properly collecting the phonic substance of language. We have also shown how the features of murmur and nasalization are asegmental, calling for the syllabication of the language. It is considered uncontroversial that the the segments are to be assigned to syllables and the input to phonetically motivated processes must include syllabication. It is more or less accepted that syllabicity of segments must be specified as by the feature syllabic. We have worked out a few rules of syllabication in chapter IV. Ambisyllabicity has been accepted. In closed heavy syllables vowels take stress and length. The rhythmic pattern of the language is directly related to the syllabic pattern.

In the concluding chapter we have given some rules (for the prosodies and processes) following dependency phonology and autosegmental phonology.
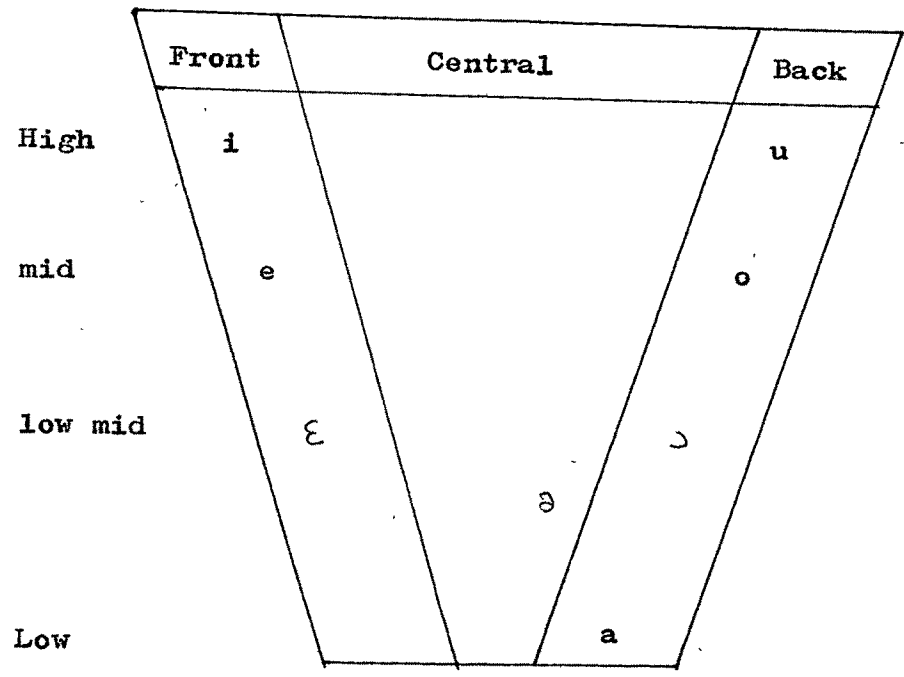
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11. Lass, 1980

(A table of Gujarati consonants and vowels is given here.)

## Table of Consonants

| | | Bilabial | Dental | Retro-flexed | Palatal | Velar | Glottal |
|---|---|---|---|---|---|---|---|
| stops | | | | | | | |
| unaspirated | vl | p | t | ʈ | | k | |
| | vd | b | d | ɖ | | g | |
| aspirated | vl | pʰ (f) | tʰ | ʈʰ | | kʰ | |
| | vd | bɦ | dɦ | ɖɦ | | gɦ | |
| Affricated stops | | | | | | | |
| unaspirated | vl | | | | tʃ | | |
| | vd | | | | dʒ | | |
| aspirated | vl | | | | tʃʰ | | |
| | vd | | | | dʒɦ | | |
| Fricatives | vl | | s | | | h ⟶ | |
| | vd | | | | | ɦ ⟶ | |
| Nasals | | m | n | ɳ | ɲ | ŋ | |
| Laterals | | | l | ɭ | | | |
| Flap | | | r | | | | |
| Semivowels | | w(v) | | | ⟵ j | | |

## Vowels



|  | Front | Central | Back |
|---|---|---|---|
| High | i |  | u |
| mid | e |  | o |
| low mid | ɛ | ə | ɔ |
| Low |  | a |  |

# CHAPTER I

## MURMUR

sosmanāṁ ghosiṇāṁ svasanādau.

(RP. XIII.6)

Murmur
# 1·0 Introduction

In this chapter the most salient issue of Gujarati
Phonology is studied. This is the issue of murmured vowels
which has been much discussed, and has attracted attention
of many linguists from abroad. In the very beginning it
should be made clear that 'murmur' is not a uniform
feature of all the major dialects of Gujarati and that some
dialects of Saurashtra Gujarati (which is commonly referred
to as a Kathiawadi dialect) show clear absence of this
feature, (i.e., the speakers who have not moved out of their
respective non-murmured -- dialect areas, have not acquired
'murmur' as a borrowed feature). No doubt there has been
always a great deal of mobility amongst Gujaratis and due
to this Saurashtrians moving to Ahmedabad or Bombay have
picked up 'murmur'.[1,2]

In the areas spreading over from North of Ahmedabad
to South of Surat 'murmur' is predominantly present.
Ahmedabad being the capital city of Gujarat. much of the
literary activity flourished here. Hence the dialect of
this area took the status of 'standard educated dialect'.

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[1] One very interesting development may be noted here.
More than two hundred years ago a large number of
upper class and/or caste Gujaratis from Saurashtra
as well as Kaira District (see the map) went and
settled in Africa. Over the generations they (being
already partially uprooted from their own land)
formed a new dialect and ended up by losing the murmur
(a feature in Kaira District dialect) and losing open

The literary figures of the first half of this century
(quite a few of them coming from Nagar community)
naturally had a role to play in shaping the educated
dialect. The conspicuous features of this Ahmedabad
Nagar dialect are:

    (1)   strong 'murmur',

    (2)   presence of open-mid vowels 'ɛ' and 'ɔ',

    (3)   clear nasalization in vowels ,

    (4)   a sharp distinction between 'ʃ' and 's',

         (i.e. palatal and dental fricatives).

I don't belong to this dialect area.[2a] I was born
and brought up in Bombay. My father hailed from Surat
and my mother's family belonged to Bombay for more than
seven generations. My schooling was partly through the
medium of Gujarati and partly through English. For my
graduation and post-graduation I studied Gujarati and
Sanskrit literature. Though Bombay is not geographically
in Gujarat, there is a considerably large population of
Gujaratis coming from various dialect speaking areas.
Until late fifties the Gujarati population of Bombay

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1. (Contd.)

    'ɛ' and 'ɔ' (a feature in Kaira district dialect as
    well as in South-coast Saurashtra dialect). This
    dialect we are tempted to brand as 'Africa Gujarati'.

2. Pandit (1957) and Dave (1967) (both from Saurashtra)
    have referred to the fact that 'murmur' being a late
    acquisition in their speech, there is a free variation
    between the murmured and non-murmured variants of
    vowels.

2a. I am one of my informants.
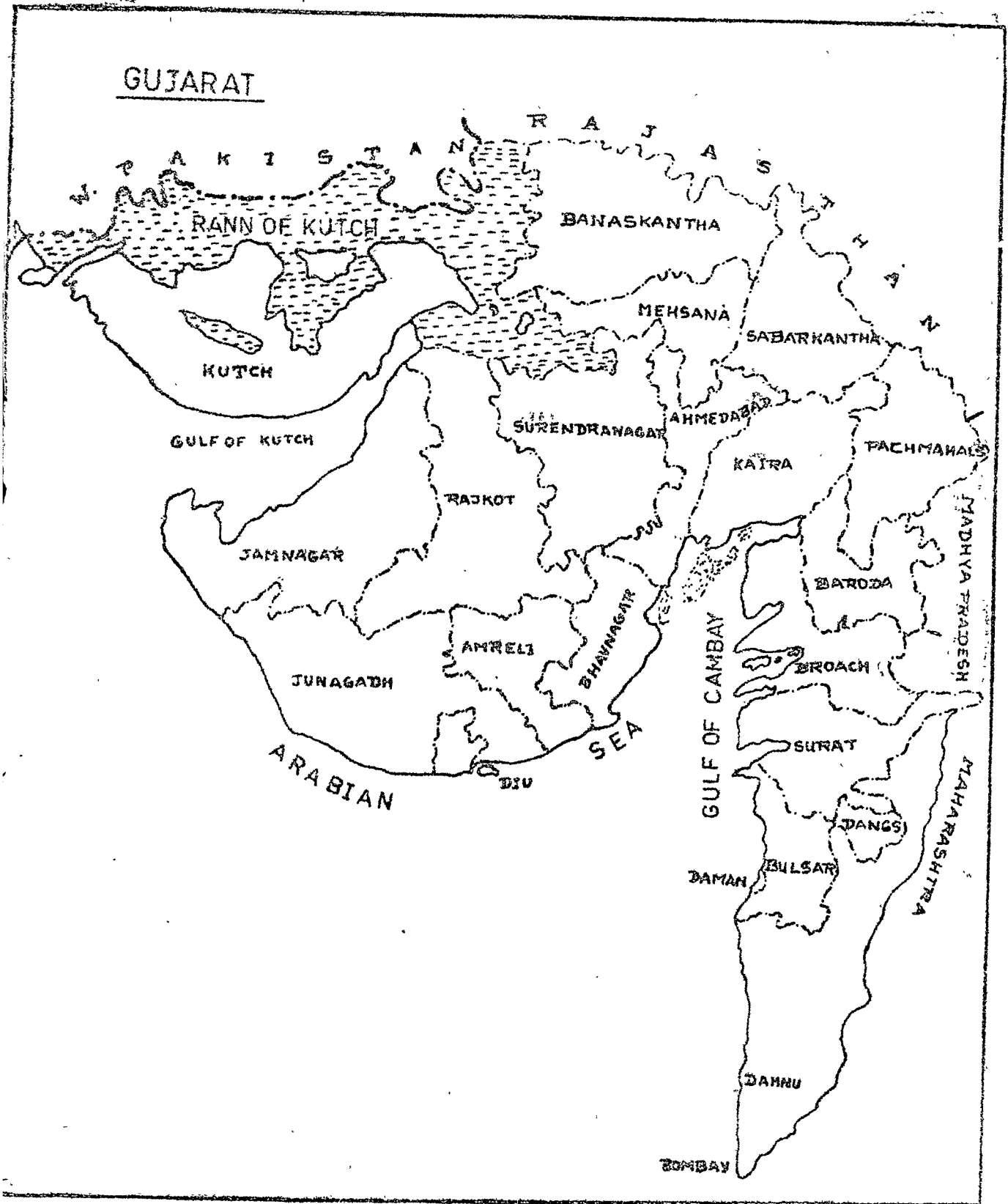
consisted mainly of upper class and caste. The strength
of Gujarati schools came mainly from these groups. This
influenced the standard of Gujarati language studies in
Bombay. One was exposed to all the dialects and yet there
was a conscious trend towards following a standard Bombay
dialect. There is a clear imprint of South Gujarati dialect
in my speech. I have 'murmur' in my vowels but I don't have
open mid 'ɛ' and 'ɔ'.

To give the rough picture of the dialect situation in
Gujarat we have classified them here giving their major
feature specifications:

(1)  the dialect with murmur and open-mid vowels
     i.e. eight vowels plus murmur
(2)  the dialect with murmur but without open-mid
     vowels i.e. six vowels plus murmur
(3)  the dialect without murmur but with open-mid
     vowels i.e. eight vowels minus murmur
(4)  the dialect without murmur and open-mid
     vowels i.e. six vowels minus murmur.

By 'six/eight' vowels we don't imply six/eight vowel
phonemes. We simply refer to presence or absence of
open-mid vowels besides 'e, o'. As our main concern is
'murmur' other features are not included in this
classification. With other features included the
classification will have to be redone.

Murmur has been considered as a distinctive feature
of the language by all the modern linguists who have

studied murmur. We want to propose that it is a non-oral phonation feature and though a characteristic feature of dialects it is not used distinctively i.e. it does not cause contrasts in segmental phonemes. The ancient Indian phonetic observations and the modern experimental phonetic observations support the proposal. Hence here we have included the summary of previous studies along with the counter-arguments and all the phonetically supporting statements.

First of all we have tried to study 'murmur' as a feature. 'Murmur' has been defined by Ladefoged as "another name for breathy voice, a type of phonation in which the vocal cords are only slightly apart so that they vibrate while allowing a high rate of airflow through the glottis".[3] The air-stream mechanism required for producing murmur is pulmonic but at the same time the position assumed by glottis for it is very conspicuously different from that for voiceless/voiced sounds. Murmured sounds can be made by keeping glottis fairly open at the end or by 'narrower' opening extending over the whole length of vocal cords. See figure 1. As Pike says "a voiced vocoid with added audible friction at the glottis... is traditionally called 'voiced' [ɦ]. If one pronounces a voiced stop and adds to it a "vocoid to which friction is added at the vocal cords as was described earlier for voiced [ɦ] "[4] one gets aspirated voiced stops'. Pike has very carefully observed the

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[3] Ladefoged, 1975, p. 279.
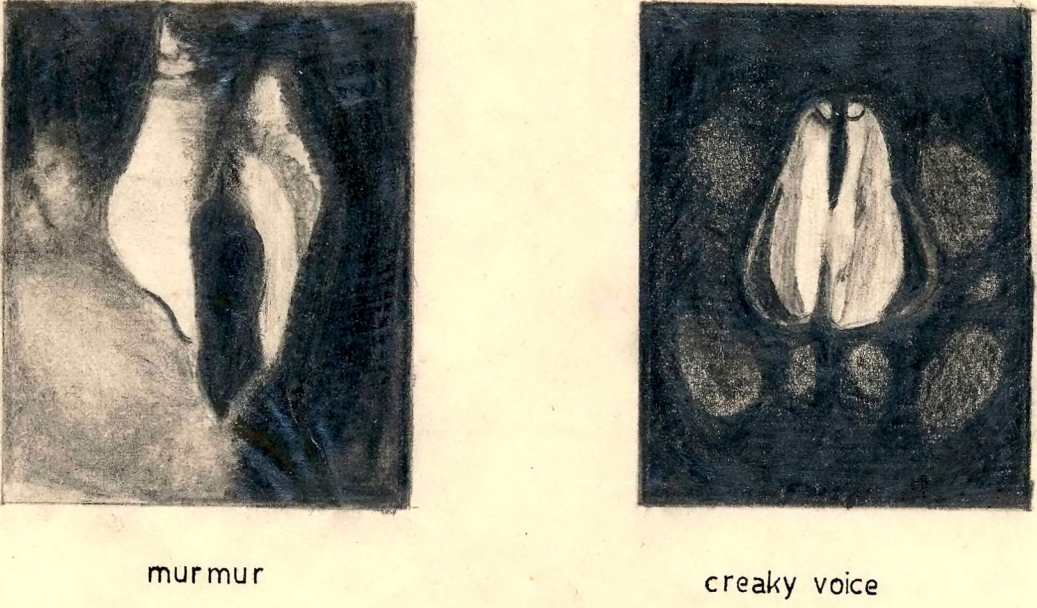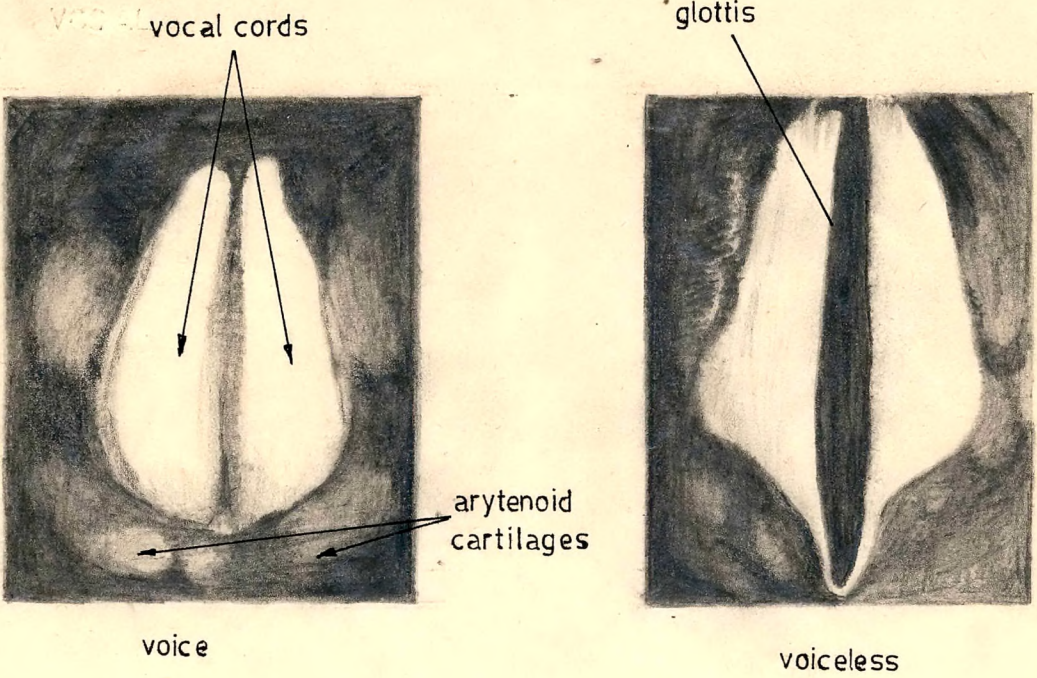
[4] Pike, 1947, p. 5, 13.

Figure 1 Four states of the glottis.

behaviour of 'voiced [ɦ̪]' when he says that "one can arrive
at a significant statement concerning the phonetic pattern-
ing of [h] , in relation to voiceless vowels and whispered
and "voiced [ɦ̄]". Both voiceless and voiced vowels have
cavity friction;... If to each type one adds local glottal
friction the first gives whispered vowels and the second
vocalic timbers of 'voiced [ɦ̄]", creating the proportion,
voiceless vowel (i.e.[h]): whispered vowel: voiced vowel:
'voiced [ɦ̄]".[5]

1-1. Murmur : as interpreted by ancient Indian scholars.
Our interest is in timbers of [ɦ̄]. Pike has also noted
that these timbers of "voiced [ɦ̄]" are frictionals but also
are resonant orals. Note many writers on phonetics discuss
'murmur'. It is an important type of phonation, though not
found commonly in many languages. The ancient Indian
treatises provide several very crucial observations. Hence,
it would be certainly worthwhile to stretch the study to
antiquity in order to know the full phonetic process involved
in this type of phonation. The ancient scholars have shown
unparallel soundness and accuracy in phonetic studies. Any
issue in I A languages requiring phonetic explanation should
not neglect these studies. It would be out of sheer
callousness if one does not look into these treatises.

According to them 'h' is the result of 'bāhya prayatna' --
external articulatory process. They have divided
articulatory process into two main types: internal and

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[5] Pike, 1943, p. 71-72.

external. The external process can be divided into two
types as shown below:

bāhyaprayatna

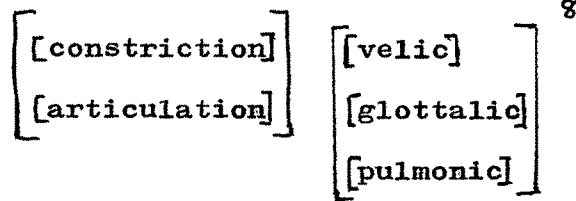| vivār | samvār |
|-------|--------|
| śvāsa | nāda |
| aghosa | ghosa |

The external processes in turn are classified
according to three different mechanisms:

(1)    glottalic    :    voice/voiceless

(2)    pulmonic    :    aspiration/non-aspiration

(3)    velic    :    nasality/non-nasality.

Mahulkar has very well shown this diagrammatically.[6]
See figure 2.

Allen has rightly said that "in their recognition
of the voicing process the Indian phoneticians make one
of their greatest single contribution".[7] As Mahulkar
has pointed out ancient phoneticians used two matrices,
one to indicate the internal activity (with two sub-
matrices) and the other to indicate the external
activity (with three sub-matrices).

$$\begin{bmatrix} [\text{constriction}] \\ [\text{articulation}] \end{bmatrix} \begin{bmatrix} [\text{velic}] \\ [\text{glottalic}] \\ [\text{pulmonic}] \end{bmatrix}^{8}$$

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6. Mahulkar, 1981, p.91.

7. Allen, 1953, p.33.

8. Mahulkar, 1981, p.92.

Points of Articulation

velic process

constriction

glottalic process

Pulmonic process

☐ Area of Internal processes
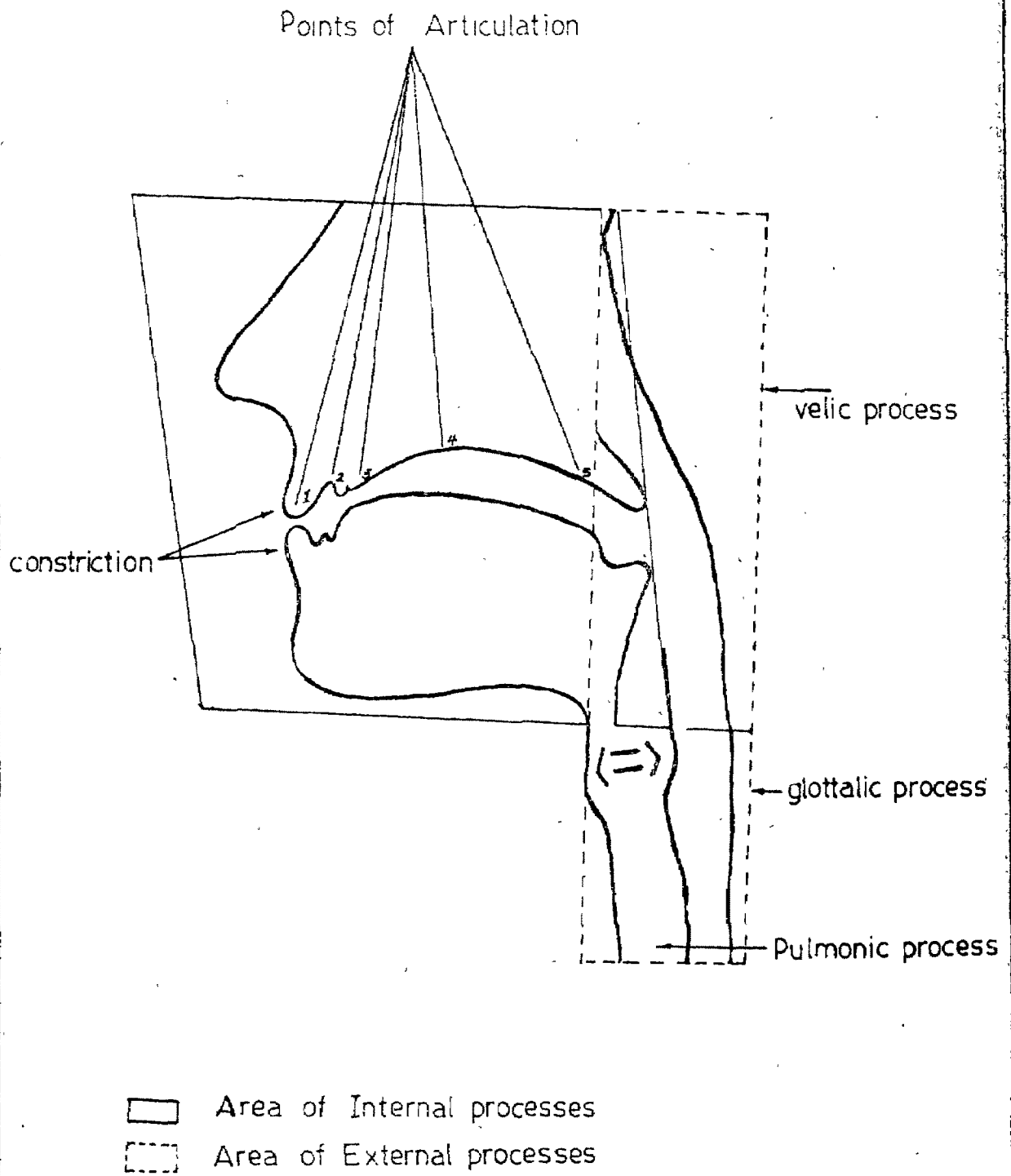
⌐⌐⌐ Area of External processes

FIGURE 2 - Areas of External and Internal processes

They have very clearly pointed out at the two
positions of glottis: "when there is effort on the
part of the speaker the air in the form of breathing
(prāna), which is the emission from the lungs
(kosthya) becomes breath or voice according to
aperture (khe) of the throat (glottis) is open or
closed or it becomes both breath and voice when glottis
is neither closed nor open".[9] In this connection
Taittirīya prātiśakhya also has similar remarks,
"when glottis is closed voice is produced when it is
open breath".[10] "and in between samvrta and vivrata
hakāra is produced".[11] This shows neat connection
between voice and closed glottis and breath and open
glottis. This also points at the production of 'h'
in the in between condition of glottis. Breath then
is the feature of voiceless sounds and voice is the
feature of voiced sounds, but for 'h' and voiced
aspirates breath as well as voice are the feature.[12]

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[9.] RK prātiśakhya (RP) 1931, XIII. 1,2.

vāyuh prānah kosthyam anupradānam

kanthasya Khe vivrte samvrte vā

apādyate svastam nādtām vā vaktrihāyāmubhayam. ubhayam vantaro-
bhau.

[10,11.] Taittirīya prātiśakhya (TP) 1906 II. 4-6.

samvrte kanthe nādah kriyate │ vivrte

svāsah │ madhye hakārah │

[12.] RP XIII. 4-6.

śvāsoghosānām │ itaresām tu nādah │

It is possible to make such accurate observations only

if one has concentrated on 'living language' as observed

by great western scholars like Benfey and Whitney. The

language dealt with by ancient phoneticians was not

"merely a religous or imperial language 'super-posed'

upon the people" but rather a secondary language used by

educated classes and therefore prātiśākhyas..."manifest a

thrilling interest in, the living phenomena of the

language".[13]    These observations are ... apt for the

behaviour of 'ɦ' (murmur) in Gujarati. The behaviour

shows that it is a feature, a phenomenon of a language

in action. It is a feature of live speech.

prātiśākhyas attach 'strong voicedness' with 'h' and

voiced aspirates.[14]   Allen has correctly explained that

'h' and the voiced aspirates are considered as more fully

voiced than the non-aspirates, and the voiceless aspirates

more fully breathed than the non-aspirates.[15]

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13. Varma, 1961, p. 17.

14. Here it would be interesting to note that RP XIV.28

while pointing at the faults (doṣāḥ) of pronunciation

of 'h' says: śvāso'ghoṣa-nibhatā vā hakāre.

The commentator says:

śvāso vādhiko'ghoṣa sadṛṣatvaṃ vā

ʰhakārasya doṣo lakṣayet.

15. Allen, 1963, p. 38.

As we proceed through these numerous remarks about
'h', a totally new 'h' required for 'murmur' emerges
out. The ancient treatises have also tried to know
'from where one utters 'h' ?' RP has been rather
uncertain when it says "either 'h' is considered
guttural or it is considered as a chest.sound".[16] But
then the freedom left for both the possibilities goes
to prove that 'h' as a pulmonic sound was observed by
them. Pāniniyaśikṣā is more observant and specific
about the occurrence of 'h' and gives a distributional
explanation: ' 'h' when followed by nasals and semi-
vowels is pulmonic, otherwise it is glottal'.[17] This
very interesting remark is crucial for us as it shows
that the voicedness of 'h' and the following sounds
can have 'inter-dependency'. The possibility of such
dependency involves or implies a requirement of
studying more than a 'segment' at a time. With this
they enter into the real field of speech. They
understood that adjustability of articulatory organs
and modifications of sounds is the part of the speech-
game. Some of them said that 'h' becomes homorganic
with the beginning of the following vowel and becomes
homorganic with the end of the preceding vowel'.[18]

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16. RP I, 38-40.

kanthyo' kārah | prathamapañcamau ca dvā
ūsmanām | keśideta urasyau.

RP has listed this possibility of homorganicity of 'h'
as one of its faults by saying that "it is faulty to make
'h' (visarjanīya) homorganic with the preceding long
vowel".[19]   But Uvaṭa in the commentary quotes another
commentator who said that 'Even for Gods it would be
impossible to pronounce 'h' in any other way'. The gist
of all this can be given as follows:

  (1)  'h' is produced when glottis is neither
       completely closed nor completely open.

  (2)  'h' can be glottal and/or pulmonic.

  (3)  this alternative perhaps implies
       environmental dependency.

  (4)  'h' is characterized by 'pure breath' and
       'strong voicedness'.

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17. pāṇinīya śikṣā 16.

    hakāram pañcamair yuktam antasthabhiśca
    samyutam | aurasyam tam vijānīyat kantyam āhur
    asamyutam |

18. TP II, 47-48.

    Udaya -svarādi -sasthano hakāra ekesām |
    pūrvānta -sasthāno visarjanīyaḥ |

19. RPXIV. 30.

    anya-sthāne dīrghatsvarāt( paro visarjanīyo
    devair api na śakya uccārayitum.

(5) 'h' has no specific point of articulation and
    has a tendency of becoming homorganic with the
    preceding and the following vowels.

(6) 'h' is vulnerable to modifications and also is
    capable of influencing environmental sounds by
    its 'voicedness' and 'breath'.

Allen has felt that "the aspiration of the voiced
aspirates is voiced and there are strong historical
phonological reasons for believing the Sanskrit 'h' to
have been 'voiced h' $[ɦ]$ "[20]. This can be proved from the
examples like this:

$$h < * g^h \text{ in hima}$$

within Sanskrit we get

    ghnanti          hanti

    tat + hi         taddhi   etc.,

This leads to a point from where we propose the
hypothesis regarding murmur (i.e. $[ɦ]$ ). 'h' of I.A.
with no definite point of articulation, with strong
voicedness and with flexible, adjustable homorganicity
does not remain merely a phonetic segment but a speech
phenomenon. It is a process which can extend influence
on or can be influenced by nearby sounds. It has a power
of 'over-blowing' the following vowel. Allen has noted
that Indian scholars regarded 'h' as a feature of
a non-linear nature i.e. non-segmental.

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20.
    Allen, 1963, p. 35.

They had perceived the 'breathy' effect that 'h' could
bring over on the segmental phonematic units which are
linear. Allen agrees with this view and believes that
"except for transcriptional purposes the representation
of a complex structure by category labels based on a
mono-systemic analysis is an unacceptable procedure".[21]
As it is known the attitude of Indian linguists was
towards 'synthesis'. Bhartrhari prescribed that
"within the sound unit the component features have no
independent existence. They realized that in studying
language as a whole it would be necessary to synthesize
the 'divided material of sentences' by using some
technique.[22] They have given number of 'Sandhi' rules
for Sanskrit. These efforts of Indian phoneticians to
synthesize the units of language were what Allen named
as 'prosodies'. In giving the sandhi rules for
juxtaposed sounds the phoneticians have given the
natural phonetic processes. They gave three processes:

| voicing | : | aasit + raajaa | = | aasidraaja |
| aspiration | : | labh + -ta | = | labdha |
| nasalization | : | vaak + mama | = | vaaŋ mama |

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21.
  Allen, 1963, p. 8.

22.
  Allen, 1963, p. 9.

Some examples from Sanskrit where in a sequence like 'h' +

nasal/semi-vowel,'h' is phonematically not significant.

Here the process of breath and nasality overlap e.g.

Kiṇhṇute.[23] This overlap may be due to 'nonlinear'

quality of 'h'. This outflow of voiced breathiness of

'h', spreading over the surrounding sounds makes it

inevitable to understand the requirement of synthesizing

language material by studying sounds in context.

1-1-1 'Murmur' as a laryngeal Phenomenon : a prosody

'h' which has 'karanabhava' (having no mode of

articulation) and which is 'parāsraya' (pāṇīya śikṣā)

(dependent sound) can behave like a prosodic feature.

This feature has interaction with sonorant sounds, such

as:

$$(1) \quad h \; + \; v$$
$$(2) \quad v \; + \; h$$

homorganicity.
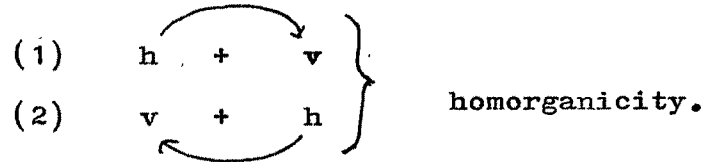
RP says that the aspiration of sonant aspirates shows a

strong sonant breathing.[24] Such breathing crosses over and

reaches the following vowel. It is like a 'spread'

phenomenon which covers its surroundings.

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23. Allen, 1963, p. 71.

24. RP XIII. 17.

    ghosināṁ ghosinaiva ǀ The commentator

    says, ghosinām sosmanām ghosinaivosmanā ǀ

    hakāren ityarthah : sosmatām ahuḥ .

    gha, jha, dha, dha, bha iti.

The interaction of 'h' with voiced consonants can

be as follows:

(3) $\underset{\smile}{c}$ + h + v = $\underset{v}{c}\overset{h}{}$ + v $\}$ voice and breath

and with voiceless consonants the interaction will appear

in the form of 'emission of more breath'

(4) $\underset{V.L}{c}$ + h + v = $c^h$ + v $\}$ breath

This character of 'h' allows us to make a fairly

obvious departure from the usual mode of phonological

description. 'h' if and when does not behave as a segment

will force us to view it from two different directions:

horizontal and vertical.

Vertically, for the model of description where 'h' - prosody comes as a non-linear tier above the segmental level.

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|_____
   v    h    c    h    v
             v
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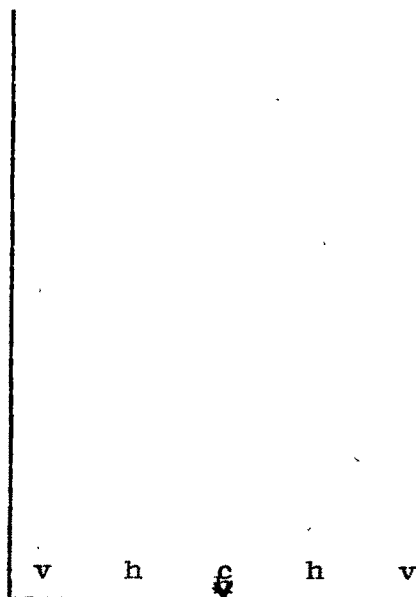
Horizontally in a conti- nuum of speech showing the capacity to spread on the surroundings. This prosodicity is the actual speech event.

We have shown that this proposal of Quirk has lot of support[29]

from ancient phonetics. There is an implicational

suggestion in this proposal that only if we accept the

horizonal prosodicity we can propose the vertical

direction in the description. There is one more aspect

to 'h'. Lass has very aptly described the bigestural

characteristic of the sound segments because there are two

relevant articulatory configurations: laryngeal and

supralaryngeal. The first one is a categorial gesture

and the second is a locational gesture.[25] Mahulkar's

diagrammatic representation of the internal and external

processes can help to understand even Lass' proposal.

Lass has considered 'h' as showing 'shifted (locational)

gesture' -- i.e. both the categorial and distinctive

subcomponents are realized only laryngeally.[26]

Pratisakhyas have indicated that 'h' can be pulmonic and

the external process in case of 'h' which has no specific

point of articulation can become predominant. Lass holds

similar view in considering 'h' as a defective unit in

terms of system of opposition because 'it's matrice lacks

defining specification for features that are purely

intra-oral'.[27] In fact Lass goes one step further and says

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25,26. Lass, .. 1976, p.153.

27. ibid, p.154.

that any 'phonological' segment is represented as a two-
part matrix, consisting of sub-matrices labelled [oral]
and [laryngeal]. Lass insists on keeping these two
parameters independent to show that each is a possible
proper domain for a phonological rule in addition to the
whole segment being such a domain. For Gujarati 'murmur'
we want to show that it is the result of the laryngeal
realization of categorial and distinctive gesture.
[ɦ] which is a voiced fricative gets de-oralized in few
of the Gujarati dialects as Lass has shown:

$$\begin{bmatrix} [\text{oral}] \\ [\text{laryngeal}] \end{bmatrix}$$

i.e. (a) gesture shift: $[+ \text{ conti}] \downarrow [+ \text{ conti}]$

(b) de-oralization $[\text{oral}] \longrightarrow \phi$

Putting it in Lass' formula we can give a general
representation of [h] - weakening:

$$\begin{bmatrix} [\text{oral}] \\ [\text{laryngeal}] \end{bmatrix} \longrightarrow \begin{bmatrix} \phi \\ \text{laryngeal} \end{bmatrix} \longrightarrow \begin{bmatrix} \phi \\ \phi \end{bmatrix}$$

Gujarati    possibility of

murmur is   'h' getting deleted.

at this stage.

This way of looking at 'h' clearly indicates at its
potential 'laryngeality'. The question is how do we
describe such 'de-oralization' of murmur? As noted in
the introduction any description having only segmental

approach is insufficient for murmur. This provokes a little digression here. The phonological descriptions uptill 1950's depended only on the contrasts based on the 'garden variety of minimal pairs'. Their activity depended on an inventory of phonemes and listing of conditions for the occurrences of their 'variants.' Their motto 'one phoneme one symbol' obviously presupposes segmental phonology. To have adequate transcriptional symbols was so important a requirement that it becomes almost synonymous with the requirement of framing an adequate phonological theory. Such symbol finding activity created a methodological mirage. Phonologists painfully faced the self-created problems such as phonemic overlapping, non-uniqueness of phonemic solutions etc., In Firth's words "one after another phonologists and phoneticians seem to have said to themselves: 'your phonemes are dead, long live my phonemes'.[28] Firth insisted on building up a generalized transcription and at the same time studying 'the relation of the symbolized element to the type of context in which it appears and to all other different symbolized elements that may also occur in the given type of context'.[29]

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28. Firth, 1957, p.122.

29. ibid, p.47.

Firth was the first to note that the language has to be
described in terms of two fundamentally different kinds
of elements: phonematic units and prosodies. Firth
had realized that symbol is artificially discovered
static cover, but the speech is highly dynamic and
complex 'continuum'. With keen phonetic skill and
auditory perception we are able to break this continuum.
Indian phoneticians showed how these parts analyzed from
the continuum undergo various transformations until they
are synthesized into actual speech acts. However, the
modern phonologists never tried to put the segmented
parts to where they belonged. Tatham has remarked that
though the basis of all phonological theories should
derive from the theory of speech production it seldom
does, instead it derives from some kind of informal
survey of the data of phonetics. Phonology would be
the better off if it proceeded from phonetic theory
rather than reorganized phonetic data.[30] Chomskian
and the post-Chomskian phonologies also have missed the
dynamicity of spoken sounds. The standard generative
theory (S.P.E. and Post S.P.E. generative developments)
has a 'homogenous straight forward and appealing
structure of phonological and phonetic representations'.[31]

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[30.] Tatham, M.A.A. (PSICPS) 1971, p.1205.

[31.] Anderson, (Ed. Dinnsen) 1979, p.22.

This theory divides its two dimensional array into elements of uniform size segments with no additional hierarchical structure. The theory is equally negligent to the fact that some features need not take as their domain precisely one segment. Hence it is not at all surprising that Allen commends the ancient Indian treatises for carefully studying the dynamicity of speech. They had realized the prosodies of voicing, aspiration and nasalization which can extend over a stretch of speech (may be a syllable, a word or even a sentence). Amongst the modern phonologists, Firth's prosodic approach is a radical break-through from the segmental phonology. "Whereas the phonemicist maps the phonic data onto a unilinear sequence of phonological segments, the prosodist describes the data in terms of two fundamentally different kinds of elements".[32] The first approach is uni-dimensional and monosystemic the second is two-dimensional and polysystemic. "The aim of prosodic analysis" according to Robins "is not that of transcription or unilinear representation of languages but rather a phonological analysis in terms which we take account not only of paradigamatic relations and functions which are operative in speech." These syntagmatic factors should be systematized and made explicit in phonology, no less than paradigmatic contrasts".[33]

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[32]. Lyons (Eds. Jones W.E. and Laver J.), 1973, p.231.

[33]. Robins (Eds. Jones W.E. & Laver J.), 1973, p.265.

We are aware that most phonologists have made distinction between phonetics and phonology. However, some like Ohala consider phonetics as "an indispensable tool for the phonologists"[34] and the natural generative phonologists have not long since realized the importance of phonetics. Halle insists that "the study of speech sounds must yield insights into articulatory aspect of the sounds, it must concern itself with the acoustic and psychoacoustic character of the sounds".[35] While trying to understand 'murmur' it was realized that all the previous statements regarding 'murmur' in Gujarati are based on the prevailing trends amongst phonologists - the trend to seek freedom from too much phonetic detail; the trend where linguistically relevant aspects were distilled from an inifinitely variable speech behaviour. Modern experimental phonetics extends enough support to our views regarding 'murmur': Ondrackova affirms that the movements (of the vocal cords) are three dimensional and highly non-linear especially in chest voice.[36] Van den Berg holds similar opinion.[37] That a chest sound should have highly complicated vocal cord movement should be considered as an interesting feature for 'h' too.

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34. Ohala, 1974.

35. Halle, (PSICPS) 1971, p.179.

36. Ondrackava (PSICPS) 1971, p.32.

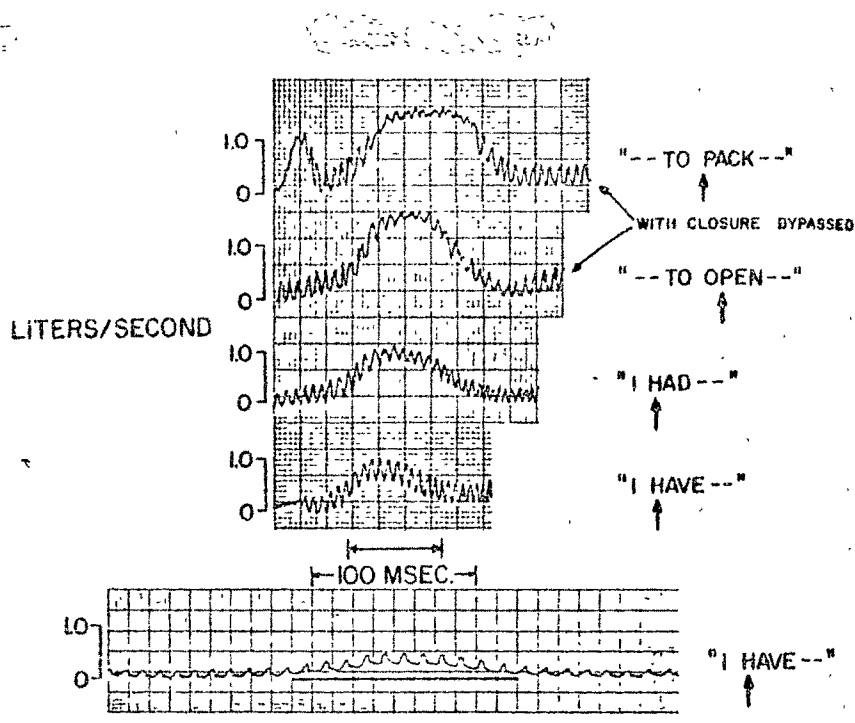37. Van den Berg (Ed: Malmberg) 1968.

Fig. 3   Volume velocity waveforms during a cyclic glottal opening movement. From top to bottom:
   voiced — open — voiced
   voiced — open — voiced (minimum duration)
   voiced — breathy — voiced
   voiced — breathy — voiced (minimum duration)
   voiced — breathy — voiced (in vocal fry)
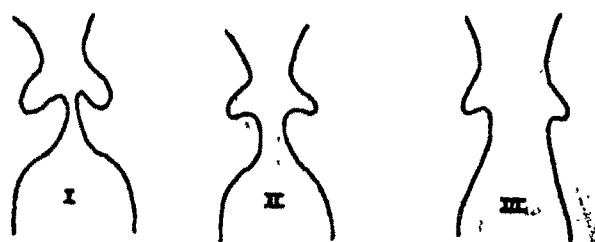
(from Rothenberg)

Figure 4 Typical vocal fold shapes at the time of oral
release in Koren stops .
I    unaspirated
II   slightly aspirated
III  heavily aspirated

Kim has explained that more the aspiration more open is
the glottis. She also notes that the turbulence
accompanying "/h/ articulation is not created at the
glottis but at the point of constriction for the follow-
ing vowel whose configuration is formed through co-
articulation during /h/".[38] The strong voice and the
turbulence of '/h/' are closely associated with the
adjacent vowels in the murmured dialects of Gujarati. It
is also noted that "the explosion burst of an aspirated
stop like wise shows a considerable concentration of
acoustic energy at the frequencies of neighbouring
vocoid formants".[39] Rothenberg obtained the waveform
of airflow at the glottis and recorded volume velocity
measurements. This was done while recording the air-
flow during English /h/. He notes that breathy voiced
sound will have loose adjustment of vocal folds and
that the glottal adjustment for this sound takes only
100 msec vis-a-vis 140 msec for closed adjustment
sounds and that a larger peak air-flow is found for this
sound.[40] See the fig. no. 3. Lisker and Abramson in their
study of 'Glottal modes in consonant distinctions' have
noted that aspiration of voiced stops is voiced, unlike
the more commonly found aspiration, simply because the
glottal aperture does not become as large as, to cease the

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38. Kim, 1970, p.111.

39. Brosnahan and Malmberg, 1970, p. 129.

40. Rothenberg (PSICPS), 1971, p.380.

vibration of the vocal folds. They also assert that 'the theories of stop-voicing and aspiration that stress the importance of extra-laryngeal factors can claim less basis in observed fact than does one that stresses the paramount role of the larynx'.[41,42]. One quite convincing result comes from Kim's experiment. She observed from the Korean stops that there was maximum glottal opening for heavily aspirated stops and aspiration is a function of glottal opening at the time of the release of an oral closure of a stop, as shown in figure no. 4

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[41]. Lisker and Abramson. (PSICPS) 1971, p.388.

[42]. In the discussion of the paper Rothenberg brought out an interesting issue regarding Hindi where the glottal air-flow during the articulatory closure of a voiced stop can also be absorbed by a slight nasalization, that is, a small velo-pharyngeal opening. Here we extend a similar observation from a non-murmured dialect of Gujarati. In this dialect when a nasalized vowel is preceded by 'h' it gets slightly murmured. As 'murmur' is not the feature of this dialect the only logical reason for such murmur can be its nasalization. The examples are not many. e.g. (i) [hẽ] 'what!' (surprised by what you said) (ii) [hõ ke] 'al right?'. In this connection Ohala has a point to suggest. His nasographic experiment displayed a vulnerability of low vowels to nasalization when in combination, with glottal consonants. In British R.P. 'half' is pronounced as [hãf]. If this is proved true then 'h + $V_{low}$' may give h + $\tilde{V}_{low}$ and this in turn may show the breathiness and voicedness getting over flown. e.g. ɦ + ṽ       murmur
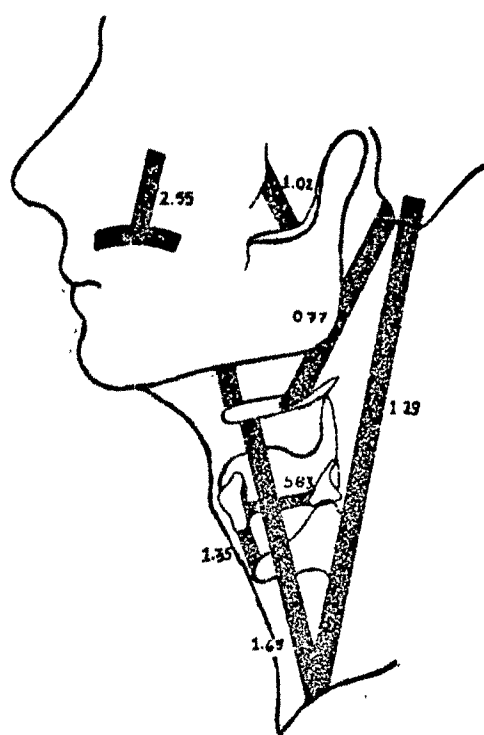                                                voice    low
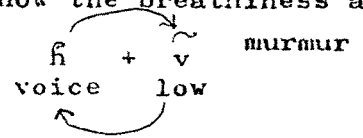
Figure 6  Index values of nerve impulse propagation
time in axons.

0.77–posterior digastric, 1.02–trigeminal.

1.29–accessory, 1.35–vagus, 1.69–hypoglossal

2.55–superior labial, 5.83–recurrent laryngeal.

(adapted from kim)

Kim refers to the valuable study conducted by Krmpotić where the length and the diameters of a dozen nerve fibers (axons) which supply neural impulses to muscles involved in speech production were measured. She tried to establish the order of degrees of latency in the propagation time by giving latency values in terms of Index i.e. the greater the index value the longer the time required for neural signals to reach muscles. The laryngeal nerves showed the greatest index value. See t ? figure, no.Kim concludes that if the signals to laryngeal muscles reach later, vocal folds may assume open position longer and as a result the voicing for the following vowel may be delayed. This delay may also make voiced stop voiceless and unaspirated stop aspirated e.g. $[b] \rightarrow [p] \rightarrow [p^h]$.[43]

This observation is suggestive, of the possibility that voice can be lost but aspiration is infact acquired. RP has warned as to the possible faults in pronunciation of Sanskrit 'h': that there is a possibility of voice getting lost and the strong 'breath' being continued. Kim has similar opinion. She has summarized voicing and aspiration as closely related phenomena.

In murmured dialects voicing and aspiration form a single continuum. Voicing and aspiration here are 'implicational phenomena'. According to generative frame work one should be able to give 'redundancy rules' for such 'relations'. But as far as the 'spread' of 'murmur' on vowels in Gujarati goes the redundancy rules

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[43]. Kim (PSICPS) 1971, p.339.

may not be sufficient. We want to propose that in any

segmental approach there is no provision for such 'non-

linear' 'spread'. There are good reasons why these two

phenomena are related. Kim extends very logical

explanation as she confirms that there is continuous air-

flow through glottis from the lungs to the upper vocal

tract during the vibration of vocal folds. "If the tract

is wide open as in vowels the airflow can proceed with no

difficulty. But when there is a constriction in the tract,

as in obstruent consonants, there is a limit as to how much

air can flow into the closed cavity. As more air flows

into the oral cavity the pressure in the cavity becomes

higher. If no adjustment is made this increasing

pressure equalizes the pressure differential across the

glottis and the voicing stops".[44] In Gujarati the

required adjustment must be taking place at the right

moment; i.e. before the discontinuation of voicing. The

adjustment here means increase in the cavity size to

accommodate the air flow. e.g. in a pair of words such

as

$$[\text{pot}\int\tilde{\text{u}}] \qquad \text{soft} \quad (\text{neuter})$$

$$[\text{ph}\tilde{\text{o}}\text{t}\int\tilde{\text{u}}] \qquad (\text{I}) \quad \text{reach}$$

the pronunciation of the second word clearly will show the

expansion of the cavity. Kim feels that 'though one can

blow out one's cheeks to achieve this purpose, this is

normally not done in speaking.' One agrees partly with Kim
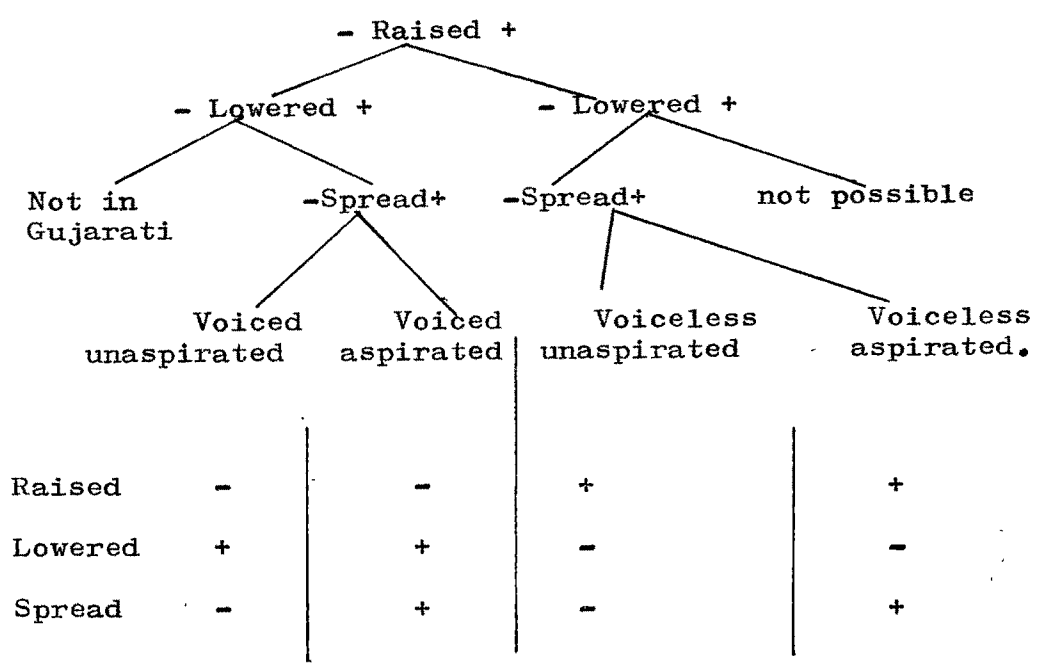
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[44]. Kim, (Ed. Dingwall) 1978, p.187.

that there is no conspicuously visible blowing of the
cheeks. However, there is or clear cavity expansion for
Gujarati murmured pronunciations. As Kim suggests the
simultaneous adjustment is done by lowering the glottis.
On the other hand in tense voiceless consonants high
sub-glottal pressure will often push up the glottis.[45]
Kim has succinctly summarized the relationship between
glottal pressure and rate of vocal fold vibration
(i.e. pitch). She asserts that "higher the sub-glottal
pressure the higher the pitch. Thus in high-pressured
voiceless obstruents the adjacent vowels tend to carry
a higher tone than those adjacent to voiced segments
which due to the constantly escaping air have a lower
sub-glottal pressure". Kim gives Maran's classifica-
tion like this:[46]

    (1)  Raised (raised glottis can stop the voicing)

    (2)  Lowered (lowered glottis will retain the voicing)

    (3)  Spread (spread glottis yields aspiration as the
               air can continue to flow)

    (4)  Constricted (constricted glottis is used for
               glottalic sounds like ejectives,
               implosives, creaky sounds etc.)

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[45.] For the non-murmured i.e. tight phonation dialects of
Gujarati the glottis does get pushed up. See the
photograph on p. 103

[46.] Kim refers to Maran L.R.'s unpublished Ph.D.
dissertation on 'Tones in Burmese Jinpho' 1971,
U.of I.

We have put the relevant features for Gujarati in the table below:

```
                        - Raised +
              - Lowered +            - Lowered +
       Not in        -Spread+    -Spread+      not possible
       Gujarati
            Voiced   Voiced    Voiceless      Voiceless
         unaspirated aspirated unaspirated    aspirated.
```

|         |   | Voiced unaspirated | Voiced aspirated | Voiceless unaspirated | Voiceless aspirated |
|---------|---|---|---|---|---|
| Raised  | - |   | - | + | + |
| Lowered | + |   | + | - | - |
| Spread  | - |   | + | - | + |

Kim's observations have certainly more insightful explanation.

Modern phonetic experiments – neurophysiological, physiological, acoustical etc. – have directed many a ways for attempting some explanation in phonology. We note to our benefit that many phoneticians have concentrated on 'h'. This 'h' being a laryngeal sound, no matter from where they begin they have to make some reference to it if their experiments are regarding vocal-cord activities. Here we summarize the ancient and modern phonetic observations together in order to get clear picture of 'h'.

# 1·1·3 Comparable features of ancient and modern studies

44

| Ancient Indian | Modern |
|---|---|
| 1. 'h' is the result of bāhya prayatna - external process- and that it is the pulmonic sound.<br><br>For 'h' glottis is neither closed nor very open. | Breathy voiced sound will have loose adjustment of vocal folds (Rothenberg)<br><br>Aspiration of voiced stop is voiced. |
| 2. For 'h' and voiced aspirates voice and breath are the features. | (Lisker and Abramson) Ohala's observation about vulnerability to nasalization of |
| 3. (i) 'h' can be either a guttural or a chest sound. | low vowels in contact with 'h' can be reviewed in this connect- ion. As 'h' is pronounced with |
| (ii) Pāṇinīya sikṣā defines that 'h' is pulmonic when follow- ed by nasals and glides, i.e. antasthas. | loose vocal folds and air-flowing out, there is a possibility of soft palate getting into a lax position. No doubt this is a variable factor. We only note the |
| (iii) 'h' has a tendency to be homorganic with adjacent vowels. | suceptibility of 'h' as well as the adjacent vowels in forming a continuum. Rothenberg records |
| 4. 'h' has karaṇābhāva and it is parāśraya. Allen felt that it is due to these qualities that the ancient phoneticians never treated 'h' as a segment but considered it as a <u>non- linear</u>, <u>non-segmental</u> and <u>transferable</u> feature. | the volume velocity measurement of glottal air-flow. For this purpose he studies breathy voice with its preceding and the follow- ing stages. He does not give any reason as to why he takes this particular sequence but it is obvious that 'h' being a breathy <u>process</u> it can be the best example |

for such a study of continuum

By such a comparison we don't imply any one-to-one
parallel similarity. The idea is to show the significance
of these studies for the study of murmur.
1-1-4 'h' in IA
   Having surveyed the phonetic behaviour of 'h' it would
be worthwhile to see how the Sanskrit 'h' behaved through
the historical stages. We are aware of the two facts that
the description of the sounds in pratiśākhyas cannot be
directly applicable to modern IA languages and that any IA
language of today cannot make much out of Sanskrit. Yet
it is true that the seemingly haphazard collection of
observations are of great value to the phonological studies
of IA languages. The period extending from Sanskrit to
Prākṛt and from Prākṛt to Apabhraṃśa brings us upto the Middle
Indian stage. Though we have the written material represent-
ing various stages it cannot serve as a direct evidence for
the spoken material. So also Prākṛt and Apabhraṃsa both show
the features suggesting a linguistic stage but they do not
represent any specific language. They provide some idea
about the varieties of different then existing dialects,
however, none of them helps to localize the language area
accurately.

   Yet from the available material one can try to make
some linguistic sense. Bloch has surmised that "if Apabhraṃsa
could be written in the sixth century, it was because the
stage of language to which it belongs, appeared in Gujarati to
be sufficiently archaic to be put on a plane with Prākṛt".[47]

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[47]. Bloch, . 1965, p.24.

During the later part of the period known as Middle

Indian (MI) a widely extensive language was prevalent

all over Gujarat and Rajasthan. "It was much later

that Gujarati, Marwadi and other kindred vernaculars

got split".[48]  Tessitori has expressed a similar view.[49]

MI stage denotes the stage some time before 1300 A.D.

Modern Indian stage can be said to have begun after

that.  Though the first Gujarati poet appears in the

15th century the scholarly and literary works of Jains

provide enough evidence to date the language to an

earlier period.  With this as a background we have

tried to see what peculiarities of 'h' sound give

distinctiveness to Gujarati in particular and Neo-Indian

(NI) in general:

> (1)  Bloch notes that IA alone of all Indo-
> European languages possesses four series
> of occlusives:  voiceless, voiced, voiceless
> aspirated, voiced aspirated.  The aspiration
> is so substantial that when the aspirated
> consonants undergo changes it is the occlusion
> and not the aspiration which is lost.[50]  This
> means that even when occlusion gets lost the
> aspiration of that occlusive is transferred
> to some adjacent segment.

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48.  Divatia, 1915, p.40.

49.  Tessitori, 1914 .

50.  Bloch, 1965, p.53 .

(2)   The voiced consonants from the Indo-
       Iranian period have transferred their
       voicing and aspiration to the following
       occlusive. Aspiration of aspirated voiced
       consonants is to some extent independent of
       their occlusion. Aspiration of aspirated
       consonants is tenacious and it is occlusion
       and not the aspiration which is the weak
       element of the voiced aspirated consonants
       in Sanskrit.[51]

(3)   The Sanskrit phoneme 'h' is a voiced
       aspiration similar in nature to the
       aspiration of the aspirated voiced consonants.

             e.g.   cid hi      ciddhi

       The 'attack' of 'h' is still perceptible in
       this position.

(4)   In p̄rākr̥t MI 's' opens in a group of
       consonants and new aspirated occlusives are
       formed when the group contains a nasal, which
       persists, the aspirate becomes voiced:

             Pali    nĥa     (snā)
                     unĥa    (usna)   etc.,[52]

It is a peculiar development: 'h' substitutes voiceless
segment, but when attached to the voiced nasals it

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51.  Bloch, 1965, P. 63.
52.  Ibid, p.68.

acquires the quality of voicedness, which along with

aspiration is bound to extend phonetically over the

adjacent sounds. IA languages show many such

examples where 'nasal + h' sequence appears and

voiced aspiration from this sequence gets extended

as a prosodic feature over the neighbouring sounds.

e.g.    Marathi    [mhəṇ]    'proverb'

                   [mhātara]  'old man'

        Hindi      [nanhā]    'small'

                   [nəhlana]  'to bathe'

This is just to say that 'voiced aspiration' does

have predictable environments and shows up in IA

languages in such environments.

(5)   'In certain circumstances an intervocalic

'h' of obscure origin becomes voiced'.[53]   This

observation is in a way similar to the preceding one.

In Bengali intervocalic 'h' is voiced:

e.g.    [mohim]    'big'

        [gohon]    'deep'

It can be seen from this that since the days of

Sanskrit till now 'aspiration' has persistently

remained in all the IA stages. Merging with stops it

has produced the whole series of aspirated stops.

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[53]. Bloch, 1965 P.68.

When merged with voiced stops it shows the potentiality
to spill a strong voiced breath which no longer remains
a segmental feature. This behaviour of 'h' is true even
when it is in neighbourhood of nasals, liquids, and
glides. Many examples of this nature can be given.

   e.g. Marathi [lǝɦ̃an] / [lɦ̃an]  'small'

        [wɦ̃aɳǝ]    'shoes'

    Hindi  [rǝɦna]    'to stay'

        [ɟǝɦæ̃]*   'here'

        [wǝɦæ̃]*   'there'

*(here the following nasalization also is pertinent).

No doubt in these languages (where 'h' acquires
'voicedness' environmentally) 'h' does appear as a
voiceless variant.

   e.g. Marathi [gǝhu]    'wheat'

        [hat ]     'hand'

    Hindi  [hat$^{h}$]    'hand'

Sanskrit had a voiceless 'h' in the form of visarjanīya.
"There is no longer any trace of it in MI".[54] The
question will be 'from where does the voiceless variant
of 'h' of modern IA come from?'. It would be worthwhile
investigating a comparative data from these languages.

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54. Bloch, J. 1965, p.68.

Marathi, Hindi, Bengali, Kutchi, non-murmured dialects
of Gujarati, all have voiceless 'h'. Gujarati murmured
dialects also provide a highly complicated situation.
There are dialects with very strong murmur and the
dialects with comparatively weak murmur. The weak
murmur dialects sometimes show strong breath in 'h' when
not in weak environment (Here by weak we imply non-medial position.
and not when in the neighbourhood of nasals, liquids, glides
etc.) This 'h' with stronger breath may become voiceless
in some individual's speech. The non-murmured dialects
definitely have voiceless 'h' with strong breath.[55]

In fact what Sanskrit so clearly had as a 'voiced
aspiration' has come down upto Gujarati in its full-
fledged expression - i.e. as a murmur prosody. It looks
like that over the different developmental stages the
voiced aspiration kept its strength and in some dialects
of Gujarati perhaps it found appropriate medium for its
manifestation. Why some dialects of Gujarati have no
such voiced breathiness and why languages like Marathi,
Hindi, Bengali, despite their voiced-breathy-intervocalic
'h' have voiceless 'h', are the questions which may not
have any answer from synchronistic or diachronistic points.
The questions may be answered by socio-linguistic
approach.

All this detailed background was needed:

(1)   to prove that 'h' is potentially prone to
turning into the voiced breathiness;

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[55]. RP XVIII, 28.

and to prove that this 'h' can be de-oralized and simply
show up as a laryngeal feature at times.

(II) to propose that in murmured dialects of Gujarati
it is this 'h' element (either in the form of the
voiced aspirated stops or in the form of the segment
voiced 'ĥ') which is the propagator of murmur in the
adjacent vowels;

and to propose that the spill of voiced breath from
these two situations is like a non-linear spread
phenomenon and as such cannot be described at
segmental level alone;

(III) to suggest that it is peculiar to the murmured
dialects, where it finds its way in the forms of a
unique expression which is musical;

and to propose that as all the studies of Gujarati
murmur upto now have seen it segmentally they have
missed its crucial non-linearity feature. As Firth
has said monosystemic analysis has reached, even
overstepped its limits.[56]

1.2 Divetia's views

In this connection, We will summarize all the
previous studies. However, none of them can be a
point of reference from where the further research
should begin. Although Gujarati is one of the most
important IA language no adequate description of any
aspect of phonology of that language is available.

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[56]. Firth, 1957, p.137.

Three earlier works belonged to pre-modern Gujarati
days.  These are:

(1)  Divetia, Wilson philogical lectures, 'Gujarati
        language and literature', 1915-1916;

(2)  Turner, 'Gujarati phonology', J.O.R.A.S., 1921;

(3)  Dave, 'The language of Gujarat', J.O.R.A.S.,
        1948.

Divetia and Turner have studied the sounds over the period
of development through the history.  Divetia gives
different dialect areas based on rough geographical
divisions without giving any dialect specifications.
Turner does not mention any dialect division except that
he admits that "even in modern Gujarati we do not reach
linguistic unity except in so far as the literary
language, arisen out of a mixture of dialects".  Turner
is right when he says that this literary language "is
generally used and understood by the educated over the
Gujarati area."[57]  As Turner's study mainly was
concerned with the developmental stages from MI to
Neo-Indian (Gujarati), the dialect variations could be
neglected.  But Divetia talks about murmur and yet
does not distinguish between the murmured and non-
murmured dialects.  However, it is Divetia who has for
the first time given special attention to 'h' in
Gujarati which he names as 'laghu prayatna hakār'. He
says 'laghu prayatna hakār' is a sound not so named
any where but it is largely noticeable in our

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57. Turner, 1975, p.91.

vernaculars and perhaps existed in Sanskrit; He feels

that 'aurasya' and 'kanthya' hakār of Pāninīya siksā

may correspond to two 'hakār'[S] of Gujarati: 'laghu

prayatna' and 'guruprayatna' i.e. the weak 'h', the

aspiration whereof is diffuse and the strong 'h' the

aspiration whereof is concentrated.

e.g.   laghu prayatna: इमे, इभाई, इवे, इभाी.

   guru prayatna: दइवे, पइन, इष. etc.[58]

He has meticulously described the origin of 'h'. He

classifies his 'utsarga' on the basis of the features only

specific to Gujarati and which are partially shared by

other IA languages with Gujarati.  'laghu prayatna'

hakār according to him is not specific to Gujarati

alone.  He noticed this feature in other IA languages

and this is a very significant observation.

He further puts down three phonetic conditions for

'h' in Gujarati:

(1)   Where 'h' is either samsrsta or samkirna

and either has moved towards the beginning

of the word or towards the final part of

the word

(2)   An extra 'h' is added where in the original

there was none

(3)   The original 'h' is dropped.

He defines the term 'samsrsta' as a 'mechanical

mixture of sounds' and 'samkara' as 'chemical combination'

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58. Divetia, 1915-16, p.115.

i.e. it is a complete fusion of sounds. Samkara process[54]

of 'h' can occur with consonants as in,

sanskrit     prākṛt-Apabhramsa     Gujarati

gabhīrakam     gahirāu          gherū    'dark'

and with vowels in,

adhuna     aunā - haunā     hamna     'now'

This is rather a misleading statement. There was no need

to show that 'gh' in 'gherū' is a samkara from 'g+h'

because for him there are only two pertinent possibilities:

'laghu prayatna' and 'guru prayatna'. He is very critical

of Dhruva for regarding 'h' in a different manner. Dhruva

considers 'h' as "aspiration pervading adjacent vowel" and

calls this aspiration as prānadhvani. Further he recommends

the symbol of a mere dot below the aspirated syllable.

Divetia was misguided and trapped in trivial matter such as

symbols, when he says "if one used a dot and wrote ઘ઼ન

instead of ઘૈન then one must write ऒ઼ૄ instead of ઇૄૄ".[59]

Divetia could not see that ઘ (gh) which is a 'samkara'

form by his own definition, cannot be compared with a

'samsṛsta' form such as 'ઘૈન'. Divetia has confused the

issue of symbol with the phonetic value of 'h' and hence

has missed the point which Dhruva made correctly, indicating that 'h'

extends aspiration on adjacent vowels.

Divetia is also critical of Narmad who perceived

the phenomenon rightly and felt that the word for 'we'

should be written as 'અ઼મ' and not as ' ઇમ'.

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59. Divetia, 1915-16, p.297.

Divetia considers such 'half vowel', i.e.ᵍ, '૩ૄ ' as an

absurdity and phonetic impossibility. Infact Narmad

like Dhruva had seen the element of 'h' going with the

vowel. The significant drawback of Divetia's approach

was that he did not perceive that the element of Dhruva's

'prānadhvani' 'pervading the adjacent vowel' was present

even after 'guru prayatna hakār.'. The second drawback

is that Divetia did not define all the specific

environments for 'laghuprayatna or guru prayatna

hakār'. Thirdly, Divetia generalizes his observations

which are particularly based on his dialect (viz. nagar

dialect of Ahmedabad).

### 1-2-1 Turner's views

The next important study of Gujarati phonology is

by Turner. He felt that "the most notable feature

throughout has been the progressive enfeeblement in the

articulation of stops". This enfeeblement may mean

either the loss of the final stop or voiceless stop

becoming voiced ('fortis' changing to 'lenis'). Turner

says that "Gujarati tends to neglect 'h' (intervocalic

-h- gets disappeared largely in Gujarati)... In any

case the aspiration of Gujarati aspirates in any

position is much feebler than in Hindi").[60] According

to Turner then 'h' is feebler i.e. 'laghu prayatna' in

all positions. About intervocalic '-h-' Turner says

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60.
      Turner, 1975, p.133.

that it "gets attached to preceding stops" but "in all
other circumstances -h- becomes ⁻ʰ⁻ (i.e. an -h-
pronounced with the larynx in an intermediate closure
between that for a vowel and that for an 'h')".[61]
This remark of Turner indicates that he rightly
noticed the peculiarity of ⁻ʰ⁻ in Gujarati. However,
he is more interested in the historical development.

The next study of Gujarati sounds by Dave gives
only the articulatory study. In this table of consonants
he mentions voiced and voiceless 'h' which may be
correlated with weak and strong 'h' respectively.
Going through these three works one can say that none
of them gives any cogent description of present day
Gujarati 'h'.

### 1-2-2 Pandit's views

Among the later works only three major attempts
to study phonology having modern linguistics approach
could be mentioned. Pandit's conclusions remain as the
point of reference for Dave, Vyas and for the other
studies.[62] Pandit, of course, has done the pilot work,
although all his conclusions cannot be accepted.

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61. Turner, 1975, p.133.

62. These studies are:

   (1) Cardona,G: 'A Gujarati reference grammer'
       (the University of Pennsylvania Press, 1955).

   (2) Eli Fischer Jørgensen: 'Phonetic analysis of
       breathy vowels in Gujarati' IL. Vol. 28,1969.

Pandit's work has not been critically evaluated till now. Somehow his views were taken for granted and that attitude has led Gujarati phonology into a blind alley. It could very well be left there unless a fresh approach is made.

His views on 'murmur' attracted attention of many linguists. Since that time 'murmur' has come to be associated with Gujarati language as 'the inseparable' quality.[63] Pandit's is the pioneer work as he is the first one to pronounce clearly the 'murmuredness' in vowels and to perceive a connection between aspiration and murmur. He starts his section on murmur as follows:

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62. (contd.)

(3) Acharya,S: 'hālari bolī: ek bhāsāvaignanik adhyayan'. (the linguistic study of Halari dilect) (Gujarat Vidyapith Publication, 1977).

(4) Dave,R: (1) 'A formant analysis of the clear nasalized and murmured vowels in Gujarati'. IL, Vol. 28, 1967. (2) 'Studies in Gujarati phonology and phonetics' Ph.D. Dissertation Cornell University, 1977.

(5) Vyas, M: 'phonation types in Gujarati', M. Phill Dissertation, University of London, 1978.

63. So much so that breathy voiced 'h' and its spread on the vowels in other IA languages has not been referred to.

"Aspiration in Gujarati is the breathy release which immediately follows the stop consonants and which is voiced when the preceding consonant is voiced, unvoiced when the preceding consonant is unvoiced. Murmur is voiced breath, low pitched and simultaneous with vowel," but he has also said that "Gujarati like many other IA languages has a set of aspirated stops in contrast with unaspirated stops and it has a set of murmured vowels in contrast with simple vowels."[64] It is obvious from this statement that Pandit refers to contrast between murmured and non-murmured (clear) vowels. To justify and support his view he was required to produce a few contrasting pairs for which he mixes up words from different dialects. This tendency is seen to be continued upto Dave (1977). (He has taken words like /əhɖi/ 'run' /and/dadʒʱ/ 'anger'.[65]) He wants to "consider element of murmur and element of aspiration in complementation".[66] Hence his /h/ phoneme has two allophones [ʻ]aspiration and [_] murmur. This is a vague distribution because now the allophone of his phoneme /h/ is a component of all his murmured vowel phonemes. This is an odd and absurd distribution. According to him "murmured vowels do not occur after aspirated release of stops.

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64. Pandit, 1957, p. 169.

65. These words are from non-murmured dialects of Saurashtra.

66. Pandit, 1957, p. 169.

Vowels after aspirated stops -- voiced or voiceless --
are always clear".[67] It is rather being unobservant on
his part not to notice 'the murmur' in the vowels after
'voiced breath' which can be either due to voiced aspirated
stops or due to voiced 'h'. Further he says that "Murmured
vowel does not occur before pause"[68] but he has not conside-
red words like [tʃɦa] 'tea' [nɦa] 'bathe' (imperative)'
[gɦa] 'wound'. He has given only negative environments for
the murmured vowels; (e.g., not after aspirated stops and
not before pause). Does it means that all the rest of
the occurrences of the vowels are murmured?
This is anomalous because there are hundreds of words
such as [bar] 'twelve' [baɭ] 'burn' [ taŋ]' pull'
(imperative)' etc. without murmured vowels. This
confusion is due to the fact that he does not say
where murmur can occur. To these distributional
problems he adds the problem of transcription when he
says that "when an allophone of phoneme /h/ is
simultaneous with the vowel it is murmur, when not
simultaneous with the vowel it is the aspiration of
the previous consonant. Murmur is transcribed after
the vowel, aspiration is transcribed after the
consonant".[69] This statement is an example of

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67. Pandit, 1957, p. 169.

68, 69.
    Ibid.

Bloomfieldian reductionism and transcriptionism. Pandit
applies the famous principle of economy (reducing all
the aspirated stops) without realizing that he has
created hundreds of sequences of the nature 'stop + h,
as every occurrence of aspirated stop now is the sequence
'stop + h'. Just because some dialects of Gujarati
have murmured vowels, the aspirated stops from all the
dialects cannot be reduced. He has not felt any need of
having the phonetic manifestation of /h/ as [ɦ]. So his
/h/ is either the phonetically synthesized component of
aspirated stops or it is the murmur of the vowel. This
murmur is a detachable component (In his own idiolect
there is a free variation between the murmured and clear
vowels.) but there can be no dialects without
synthesized component of /h/.

He mentions an "important alteration"... that "a
syllable final voiced aspirate release alternates with
the murmur of the preceding vowel". His examples
are:

"/labh/ ~ /lạhb/       'advantage'

/vagh/ ~ /vạhg/       'tiger'     etc."

We disagree with this observation. The word final
stops do obviously have zero release.
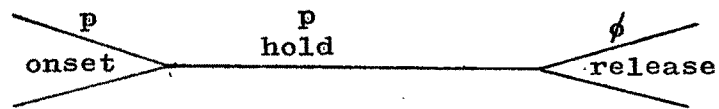
This no release/zero release variants of the sounds may sound fortis even though the stop is lenis and may lose some of its breathy release even when the stop is aspirated.



$b_o$ = fortis

$b^{\widehat{h}}$ = breathiness reduced.[70]
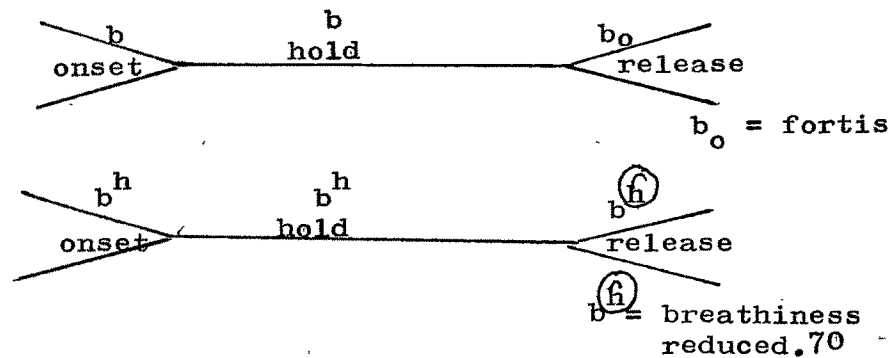
This process is in no way peculiar to Gujarati alone. It is a commonly observed phonetic result in the final position. Pandit did not see that the voiced breath of voiced aspirated stop in 'Pausa' was spilled in reverse direction thus making the preceding vowel murmured but this however never deaspirates the aspirated stop.

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70. Allen, (1963, p.72) has quoted from Atharva prātisākhya (AP) i, 43-44, about the process of 'abhinidhāna' or 'āsthāpita': Abhinidhāna is the checking of a consonant, making it obscure, weakened deprived of breath and voice; it takes place when a stop is followed by a stop: it is also called arrested (āsthāpita)

vyañjana vidhāranam abhinidhānah piditah sannataro:

hina svāsnādah sparsasya sparse abhinidhānah āsthāpitam ca.

RP says: apicāvsāne. 'it also occurs in 'pausa'. (vi.17-78)

Pandit maintains these views regarding 'murmur' even

in his 1966 book. In the beginning of his section on

murmur Pandit was almost nearer to the better explanation

as he says that "'h' has a special position'. He shows a

very significant insight when he indicates that 'function'

of 'h' is like an accent i.e. it spreads over more than one

'segment of pronunciation'.[71]

Unfortunately his 'proceduralism' does not leave him

when he discusses free-variation between aspiration and

murmur or between murmured and clear vowels. He slips

down into implausible confusion due to his mixing of the

phonologies of dialects; rather he uses his dialect for a

data, where Ahmedabad murmured dialect is imposed on his

own original non-murmured dialect. In a murmured

dialect 'murmur' as an element is so much a part of the

vowels that we have never observed absence of it where it

should be present nor have we ever heard such a free-

variation. Certainly often there are cases where there

is no environment for murmur and yet vowels are murmured

e.g. in Baroda, Gujarat; we have often heard the word for

'staircase' [dadər] being spoken as [dạd ə̣r] .[71a]

In this book he is clear about there being no

contrast between murmured and clear vowels. This is the

point where he differs from his 1957 stand. We have summed

up Pandit's arguments on murmur.

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71. Pandit, 1966, p.119-20.

71a. For explanation see p.97

1. There are eight vowels in Gujarati:

$$i \qquad\qquad u$$
$$e \qquad\qquad o$$
$$\varepsilon \quad \partial \quad \mathfrak{o}$$
$$a$$

(a) All these vowels can become murmured; (When? Environments not given).

(b) They can never be murmured if,

    (i)   they come before pause;

    (ii)   they come after aspirated stops.

(c) murmured and clear vowels don't contrast (1966).

2. There are ten stops: (including two affricates:)

| | |
|---|---|
| p | b |
| t | d |
| ʈ | ɖ |
| tʃ | dʒ |
| k | g |

(a) All these stops can be aspirated: (when? if followed by 'h'. When are they followed by 'h'? Not defined).

(b) All these stops can be unaspirated: (when? if not followed by 'h')

    i.e.   stop + h = aspirated stops.

           stop - h = unaspirated stops.

(c) Aspirated stops and unaspirated stops don't contrast. (?). In his table of phonemes only unaspirated stops are listed.[72]

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72. Pandit, 1966, p.105.

3. /h/ is a phoneme with two allophones: one is the aspiration and the other is the murmur. Aspiration occurs after the consonants and murmur occurs along with the vowels.

    (a) The allophones of /h/ have unconditional, arbitrary occurrences:

/stops/ $\binom{+}{-}$ aspiration ⟨ aspirated stop / unaspirated stop

/vowel/ $\binom{+}{-}$ murmur ⟨ murmured vowel / clear vowel

It is shown that both the efforts of Pandit fail to explain the issue. Yet Pandit's work remains as the starting point in two respects:

    (1) that 'h' functions as an accent and spreads

        on more than one segment of pronunciation,

    (2) that in Gujarati vowels are murmured due to 'h'.

1-2-3 Dave's views

Now, we turn to two other studies one is Dave's 'formant analysis of clear nasalized and murmured vowels in Gujarati' and the second is Jørgensen's 'phonetic analysis of breathy vowels in Gujarati'.

Dave has to his credit a full Ph.D. dissertation on 'studies in Gujarati phonology and phonetics' (Microfilm 1977). Between his first write up and his dissertation there is almost a period of ten years. The first paper was not intended to be a phonological study. But his dissertation has a full chapter on phonology. In his paper (1967) his views on murmured vowels, are very much similar to Pandit's except for the suggested 'free

alternation between the two pronunciations: [hoɾi~oɾi] 'boat'. In 1977 also his phonological conclusions have much of 'Pandit taken for granted - it is more or less Pandit 'resaid'. Ten years after his paper and seventeen years after the appearance of generative phonology Dave has failed to say anything significantly from the phonological view point. He still remains with the 'minimal pair' and 'contrast' procedures. One is certainly expected to do a little more probing into such complicated vowel system as Gujarati (Having e-ɛ, o-ɔ, murmur, nasalization etc.)

Actually his research is in the field of acoustic analysis. As early as 1965 he gave some acoustic study of vowels. His work has an advantage over others. He himself has quoted that "Even if phonemes cannot be found in curves, without the sound basis of phonetics no phonology can survive".[73]

Despite his good phonetic work his attempts to study phonology are highly confused. Explaining the scope of his thesis he says "Gujarati has a unique vocalic system showing a three way contrast between the oral, nasalized and murmured vowels". See the figure as given by him.
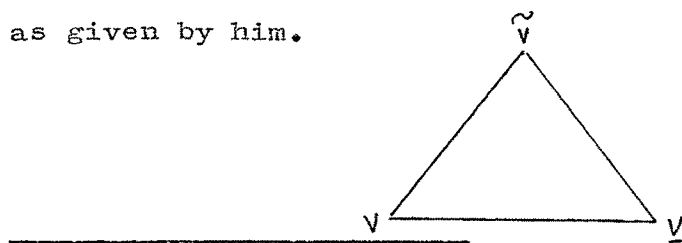


73. Dave, 1977, p. 3.

"The phonological interpretation of the murmured

(breathy) vowels is a matter of interest to any

linguist. Similarly, the phonetic analysis of the

murmured vowels and retroflex consonants is of interest

to phoneticians. This defines the scope of the present

thesis".[74] His phonological interest then, mainly will

be to interpret murmured vowels. But one cannot

interpret 'murmur' without examining the other aspects

of Gujarati sounds. Hence, we will review his whole

phonemic approach. This will mean a digression from the

issue of murmur. But the digression provides with the

core of the next issue in our work. His approach is based

on contrasting pairs. The pairs given are not convincing.

(some of the pairs are from Pandit).[75] His pairs for

[i], [e], [ɛ] are:

   [is] 'side board' [vir]    'brave'

   [ek] 'one' [veɣ]    'revenge'

   [ɛʃ] 'luxury' [vɛr]    'saw dust'.

He has noticed that the opposition between [e] and [ɛ]

is restricted to initial position or initial syllable

only, while it has not been regularly maintained in

other positions. This he notices for [o] and [ɔ] too.

He does not want to know 'why it is so?'. Dave is a

speaker of a dialect having six vowels. This is a

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74. Dave, 1977, p.3.

75. Pandit and Dave collect their data either from Sanskrit

   loans (formal literary language): e.g. [itə:r] 'others'

   [ku:p] 'well' or from typical Saurashtra dialect e.g.

                                   (Contd.)

pertinent point. A speaker with six-vowel dialect will have [e, o] in the words where the speakers of the eight-vowel dialect will have [ɛ, ɔ].

No doubt there are some words which are not common to both the dialects. Pandit and Dave obviously want to describe the dialect with murmur and eight vowels. If we compare the situations we will see that all the words with [e, o] from the six-vowel dialect are not spoken with [ɛ, ɔ] in the eight-vowel dialect. Hence, one should look for the exact phonetic reasons for the openness of [e] and [o] .

Dave's and Pandit's pairs to prove the contrasts between [e] and [ɛ], [o] and [ɔ] are given below:

Dave:

    (1)  /ver/       'revenge'

           /vɛr/       'saw dust'

           /vɛr/ is phonetically [vɦɛ̃r]. The openness of the vowel is due to 'h' in the preceding position i.e. it is conditional.

    (2)  /mel/      'put'

           /mɛl/      'dirt'

           The word /mel/ is a dialect word. The speaker from Gohilwad having [ɛ, ɔ] uses the word [mɛl], for 'dirt' but never uses the word [mel] for 'put'. Another speaker from Ahmedabad having [ɛ, ɔ] also does not use the word [mel] 'put'.

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75. (Contd.)

    [tato] 'hot tempered' [kubo] 'hut' or from uneducated dialect e.g. [ela] 'hey'. All these put together are presented as having one phonology!

Pandit:

(1)  /dʒe/          'the one who'

     /dʒɛ/          'a greeting of respect'

     The word /dʒɛ/ is a colloquial form for [dʒəj].
     Hence, this is not a proper minimal pair.  In
     the dialects having [ɛ,ɔ] the 'əj' of [dʒəj]
     becomes [ɛ]

(2)  /medʒ/          'table'

     /mɛtʃ /         'match'

     /medʒ/ is the word which is hardly used in
     any of the dialects and /mɛtʃ/ is borrowed
     from English.  Moreover, both are non-
     Gujarati words.

(3)  /peʃ/          'to present'

     /pɛs/          'enter' (imperative)

     /peʃ/ is a Persian word not ordinarily used
     in spoken Gujarati.

(4)  /mer/          'name of a tribe'

     /mɛr/          'may you die' (an abuse)

     /mɛr/ is a dialectal word.  In standard
     dialect it would be [mər] used only in an
     extremely informal situation.

Going through these pairs one wonders why they had
to harp upon such implausible pairs.  Even for [o] and
[ɔ] some few far fetched pairs are given.

Dave:

    (1) /goɭ/        'round'

        /gɔɭ/        'molasses'

    This is the only one convincing pair which exists in the eight-vowel murmured dialect.

    (2) /om/        'a syllable for mantra'

        /ɔɳ/        'this year'

    /ɔɳ/ is a dialectal word which can never be used in the standard speech. The lowering of [o] is conditional i.e. before retroflex nasal. This we have discussed in the next chapter.

Pandit:

    (1) /kʰo/        'bad habit'

        /bʰɔ/        'fear'

        /bʰɔ/        is again a highly restricted dialectal word.

    (a) /mor/   'peacock'

        /mɔr/   'mango blossom'

    Phonetically /mɔr/ is [mhɔ̃r] where the opening – lowering is automatic.

    (3) /tʃori/        'theft'

        /tʃɔri/        'dias for the marriage ceremony'

    This is one more convincing pair.

The realization of phoneme in a language is something which is highly natural to the speakers. Establishing such contrasts is an artificial excercise which linguists

have to indulge in. For any explanation of serious
nature such exercises can have only marginal place.
Almost all except t'.. two of their pairs have, either
conditional [ ɛ, ɔ] or have words taken from different
dialects or have words borrowed from foreign languages.

A dialect of Saurashtra has these broad vowels[ ɛ]
and[ɔ] . (phonetically speaking they are even lower than
those in the eight-vowel murmured dialect). The speakers
of six vowel dialect also have conditional lowering of
their [ e] and [o]. Of course, the degree varies to a
great extent. Dave himself says, "varying degrees of
openness of [e] and [o] which have been noticed by Pandit
for the medial and final positions, have also been found
in the initial syllables of our informants".[76] In
between the speakers of such different dialects there is
never any difficulty of perceiving the words due to these
differences because it comes natural to a Gujarati
speaker to accept varying degrees of lowering of [e] and
[o]. There can be some rare words where the lowering is
unconditional. Such cases may be the result of
hyperprocess of lowering. Here it would suffice to say
that to put all the variants of mid-vowels [e-ẹ,- ɛ, o-ọ-ɔ]
as contrasting sounds is unnatural and unconvincing.

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[76]. Dave, 1967, p.11.

Dave has observed that [e] and [o] are not found to be nasalized (However, this too is a doubtful statement in itself. Dave is a speaker of six-vowel dialect. A little lowering of [e,o] when nasalized is expected in the speech of such speakers too.) He says that there are only six nasalized vowels. Should he not have searched for the reason why there is no contrast between nasalized [e,o] and nasalized [ɛ,ɔ] inspite of the fact that he has observed 'varying degrees of openness of [ e ] and [o] amongst his informants?

Dave finds Pandit's solution of 'aspiration and murmur' 'incomplete' because "he does not set up the consonant 'h' either as a phoneme or as a variant".[77] This sentence is highly ambiguous. Any sound segment in the language is automatically a variant of a phoneme. Dave wants to imply that Pandit does not show the manifestation of segment 'h' anywhere (which Divetia considers as 'guru prayatna hakār).

Dave feels that, "the problem is complicated by the fact that standard Gujarati is not a homogenous language".[78] A little digression would not be out of place here. There can never be any homogeneity about

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77. Dave, 1967, p. 11.

78. Dave, 1977, p. 29.

such standard dialect, in the sense that Dave implies. One

must remember that 'standardization' is in itself an

abstraction created theoretically by the linguists (and

also by politicians). This process of abstraction is

a challenge to the linguists, for the simple reason

that educated dialect of Ahmedabad or educated dialect

of Bombay may not be exactly identical and yet from

both these one standard dialect has to be abstracted.

In doing so one should be careful enough not to mix up

the idiolectal issues: like alternation between the

murmur and the clear vowel. Such alternation of

unsteadiness of the feature may disappear with time.

No doubt other unsteady features may enter the

language. But while writing a phonology of the

abstracted standard if we consider all these unsteady

features there will be an utter confusion. Murmur is

not at all an unsteady feature in murmured dialects.

It in fact serves as a demarcation feature between the two groups of

dialects. One can accept Dave's statement about

nonhomogeneity of the standard dialect; but how does

one justify his bringing together the features of the

'western dialects' and of the 'eastern dialects' and

thereafter writing the phonology of that mixed result?

Such an approach of Pandit and Dave is highly

unscientific.

As William Labov has said "there are two distinct but overlapping concerns that motivate the study of research methods. One is the desire to find an approved and practical procedure for gathering, processing, and reporting data. The other is the need to discover if such results are right or wrong".[79] If one is not particular about the data or if one is conniving at the differences that exist in the language there is absolutely no chance of giving any convincing result.

Pandit and Dave have slipped into a kind of 'Reductionism' - either by mixing up all the dialect features or by introducing their idiolectical features: such as alternation between the murmured and the clear vowels. As already noted Pandit has not given any specific positive environments for the murmured vowels. The examples of alternation between murmur and clear vowels is as in these words: /bahr/ ~ /bar/, /pɔhr/ ~ /pɔr/. How can such a theoretically incoherent situation creep up in the data? This is not to deny the variations in the language. This is to point out at the gross over simplification that is attempted by Pandit and Dave. Working on a standardization is something like a linguist working on the theoretical abstractions. Either we stick to this or go to modern sociolinguistic methods and provide data with variations in all the dialects. It certainly is difficult

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[79]. Labov, (Ed. Dingwall), 1978, p.339.

to cope with these variations. If Pandit wants Ahmedabad

area 'Eight-vowels murmured dialect' as a standard form

then he should stick to it. Labov has correctly said "the

distinct problem of... data producing activity is to

control the effect of investigator's activity on the data

so that the final result will not be an artifact of the

investigation".[80]

A very rough idea about the issues in the vowel

system of Gujarati has been given in the figure.(See p. 75

One can easily see that the murmur and the clear

have precise divisions; While as 'eight vowels' and 'six

vowels' extend over both the areas.

Dave's /h/ is a consonant phoneme with four

variants:

(1) [ɦ] voiced glottal fricative in initial and
    intervocalic position.

(2) [h] voiceless glottal fricative occurring in
    final position

(3) [ʰ] aspirated release of stops. It is voiced
    or voiceless according to the preceding
    stop

(4) [‿] murmur, pronounced simultaneously with
    the vowel, occurring before a consonant
    e.g. [bar] and in free variation with [ɦ],
    [h] and [ʰ] (with the restriction that only
    aspiration in final position varies with
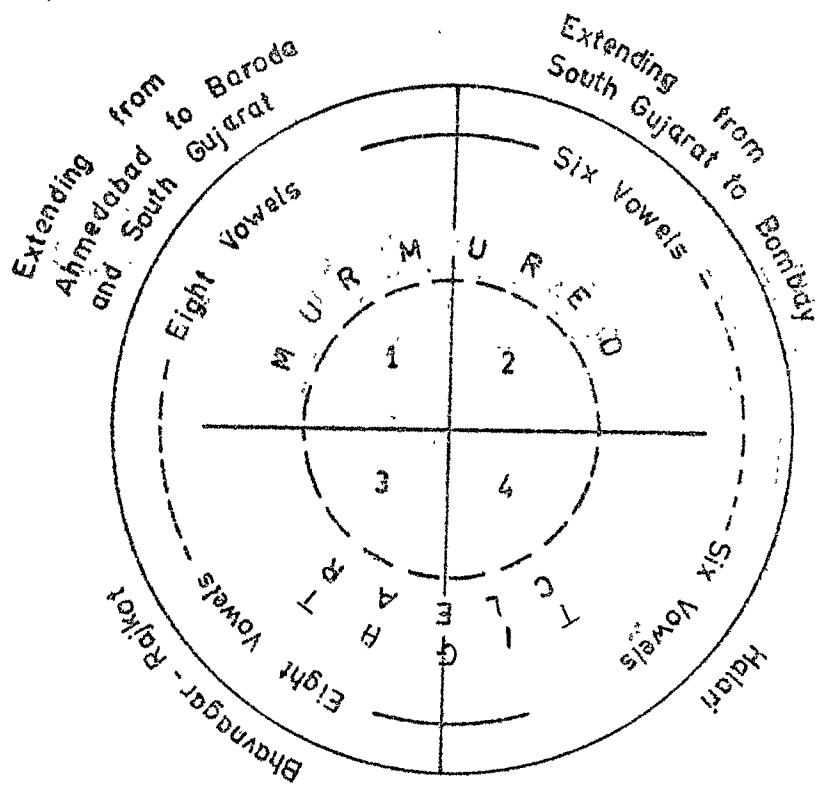    murmur).

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80. Labov, (Ed. Dingwall), 1978, p.340.

FIGURE: 6 — The dialect divisions and the differences
in the vowel systems.

From this it is clear that Dave is mixing up dialects

for his data. From his fourth allophone one gets a feeling

that Dave is condescending to accomodate murmur only before

consonants (the type of consonant is not defined); or

this murmur is in free variation with all other variants.

This is like an idiolectal study. Murmur is a very

strong, steady and predictable feature of the standard

educated dialect around Ahmedabad area and in this dialect

murmur occurs because of voiced breathiness of voiced 'ɦ'

with varying degrees of sonant breathiness (depending upon

caste, profession etc. differences). In final position

'ɦ' is not a voiceless fricative but it is a murmured vowel.

The most complicated allophone of Dave is [ $^h$ ] -

an aspirated release-which is left unexplained by both

Pandit and Dave. They call 'stop + aspiration' 'a sequence

which is to be interpreted as a cluster'. All the

aspirated stops are not phonemes; now they are clusters. No

structural explanation is extended for hundreds of new

clusters of the nature 'stop + h' and 'stop + h + liquid'

(as in [bɦrəm] ) Is it only 'the desire to reduce 'that

justifies such conclusion? Dave says "we interpret the

aspirated stops as clusters of two phonemes, one of which

is /h/ and define tenseness as its distinctive feature.

This is economical... (breathy or murmured vowels) are

also clusters in our analysis".[81]   In 'stop + h' cluster

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[81.] Dave, 1977, p. 35.

the /h/ can be voiced or voiceless depending upon
the preceding stop. But what is the phonetic feature of
this /h/ which is aspiration? How is it economical to
add hundreds of clusters? This is an incredibly casual
statement.

This detailed discussion is given here to show
that 'murmur' as studied uptil now does not satisfactorily
explain either its phonetic or its phonemic behaviour.

1-2-4 Jørgensen's views

However, Eli Fischer Jørgensen's work is one of the
finest phonetic study so far done on Gujarati. We have
tried to go through almost all the investigations
carried out uptil now. But Jørgensen's is the only work
where very precise and exhaustive phonetic investigations
are conducted.

Unfortunately, Jørgensen did not realize that both
Dave and Pandit don't have murmur in their original
dialects. Collecting a data is a tricky work. Taking
linguistically refined informants like Pandit and Dave
would mean a great help but at the same time one risks
the naturalness of the data collection procedure. Since
1957 she has tried to concentrate upon this breathiness
of Gujarati language. The paper in I.L. 1967 is the
result of her continued interest and research. Here
she has given the analysis of the distribution of
spectral energy, air flow, duration, fundamental frequency
and overall intensity of murmured vowels. Also she gives
a provisional analysis of the perceptual value of the
acoustical cues.

Jørgensen obviously had to depend on previous

studies. She has also started from Pandit's conclusions

when she says "It is well known that Gujarati has a

contrast between clear and breathy vowels... It is

obvious that phonemically the murmured vowels can be

interpreted as vowel + /h/ as proposed by Pandit. But

phonetically they form <u>one</u> <u>segment</u>"[82] whether

phonemically the murmured vowels are vowel + /h/ or not

is not the direct concern to Jørgensen. She is sure of

their forming one segment phonetically.[83]

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82. Jørgensen, 1967, p. 72.

83. This is a serious drawback of Pandit and his

followers. They have considered murmured vowels

and aspirated stops as clusters of ' v + h ' and

'stops + h' respectively. But first of all the cluster

has to be defined. Is cluster to be decided

phonemically, or to be justified phonetically?

Phonetically a cluster has to be a clear case of the

bond between two or more consonants/vowels coming

in a sequence i.e. getting juxtaposed. Phonemic

interpretation of such clusters has to take the

phonetic results into consideration. Hence

if phonetically there is only one segment then

how can one consider such a segment as a

She used minograph to which she attached Trans-pitch meter

and Intensity meter. This helped her to measure (1) dura-

tion, (2) fundamental frequency and (3) intensity. She also

used Aerometer for air flow measurements. With Fabre

Glottograph she could measure the degree of opening of

glottis. Her results are summarized here:

Air flow: A stronger air flow was found in murmured vowels

than in clear vowels (This is attributed to wider opening

of glottis). Murmured vowels also have greater amplitude.

Jørgensen feels that there is no proof that murmured vowels

should have less intensity. It is highly probable that the

loss of intensity which should be caused by the leaking

glottis is compensated for by a stronger activity of the

expiratory muscles.

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83. (continued)

sequence of different phonemes? It is also s unexplainable

why only particular phonetic segment is phonemically a

cluster? Is this an arbitrary selection? Such

parsimonians methodology shows that linguists totally

ignore the perception of the speakers of the language.

Uniformly, whole over Gujarat, irrespective of what

dialect speaker speaks, aspirated and non-aspirated stops

are perceived as distinct units (phonemes). Linguists

can have their loyalty to methodological improvement,

but not at the cost of the native speakers'.

perception. No short cat and reductions at the

methodological level can improve the description and

explanation.

<u>Duration</u>:  Vowel duration is an acoustic quality because it has been measured on the basis of acoustic curves.

<u>Intensity</u>: She found no difference in overall intensity between clear and murmured vowels.

<u>Formant Frequency</u>:  For formant frequencies she refers to Dave's findings.  He did not find constant differences between the formant frequencies of clear and murmured vowels.

<u>Distributional spectral energy</u>:  The characteristic of murmured vowels is the relatively high level of fundamental compared to the frequency region above the fundamental until around 2500-3000 CPS.

Jørgensen has proved a greater air flow, greater amplitude, same intensity as clear vowels and longer duration in murmured vowels.  All these definitely amount to the particular conditions of the glottis.  Jørgensen feels that the longer duration might be due to historical development of murmured vowels from a combination of phonemes.  But there is a possibility of indirect correlation between the duration and the degree of opening.  This was suggested by N.B. Thelin.  Yet Jørgensen feels that the difference of duration can also be found in the cases where there is no difference in degree of opening (e.g. [a - a]).  ( u  we beg to differ from Jørgensen here.  The murmured [a] and the clear [a] definitely have this difference.  A slight lowering of jaw in order to increase the cavity is obligatory for greater air flow required for breathy voiced sound.

This has been proved by Kim; and we have already noted
it. This is an inevitable physiological chain reaction.
This is also relevant for our thesis about [ɛ,ɔ] which will
be discussed later. Jørgensen is perhaps right in
pointing out somewhat 'less precise' articulation of
murmured vowels. (Divetia has connected murmur with the
easy going nature and weak physique of the community.
[h + v] or [v + h + v] or [v + h] etc., in a relaxed
pronounciation may get fused fully or partially.)
Jørgensen has compared murmured vowels with voiced [ɦ] .

She feels that the murmured vowels have come into
existence through a fusion of vowel and [h] . She says
"voiced [ɦ] is found in Gujarati after voiced stops". We
have shown that voiced aspiration is not a specific
feature of Gujarati alone but is found in a majority of
I.A. languages. Aspiration going with voiced stops
is also voiced and this was known to ancient phoneticians.
We have already noted from RP, (XIII, 65) that voice and
breath are features of 'aspirated voiced sounds.'[84]

She gives a mingogram and a spectrogram of [bɦ]
of Gujarati. The spectrogram shows that the [bɦ] has a
strong Fo (fundamental) and weak higher formants and
some noise at higher frequencies. See her figure 7 on
p. ____ no. 82

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84. XIII, 65, sosmanām ghosiṇām svāsa nādau.

b h a t
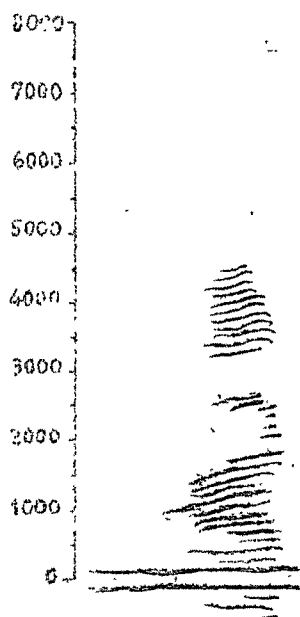
Fig. 7.

Narrow and wide band spectrograms
of bh in bhat (nB).

The strong air flow of [ ɦ] in [ bʱal] as compared to
[bal] is seen in the mingogram. This figure also
displays low intensity. See page no. 84 She proves a
very strong similarity between the 'h' of voiced
aspirated stops and intervocalic voiced [-ɦ-]. The
spectrogram of [poɦɔr] displays the same characteristic
features as that of [ bʱat] i.e. strong intensity of Fo
and weakness of higher formants; (See page no. 85)and
the mingogram shows the similarity of increase in air
flow and decrease of intensity. See page no. 86

What Jørgensen wants to drive at is that the
strong air flow, low frequency, and a strong Fo have all
been found as characteristic of murmured vowels also.
One very significant point she has made is about the
speech of RD (Dave) where there is a drop of frequency
and low intensity in the beginning of the curves of
murmured vowels. These are signs of an incomplete
fusion of [h] with vowel, so that the murmur element
is stronger in the beginning only. That she has noticed
this peculiarity of Dave's speech is crucial to our
discussion. 'Murmur' is not a natural feature of Dave's
speech; and hence there is this 'incomplete fusion of
[h] with vowel'. To be more precise we would say that
'murmur' being an imposed feature in Dave's speech, the
fusion does not arise naturally in his speech. See figure 11
on page no. 87 Somehow or the other Dave's speech displayed
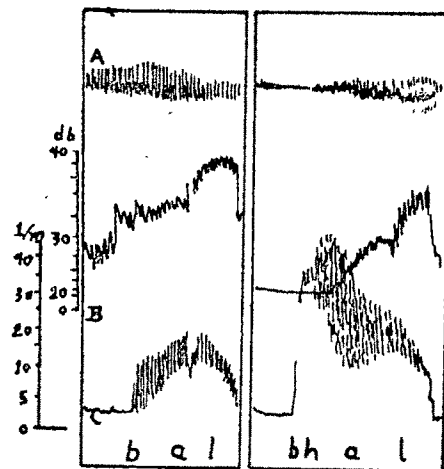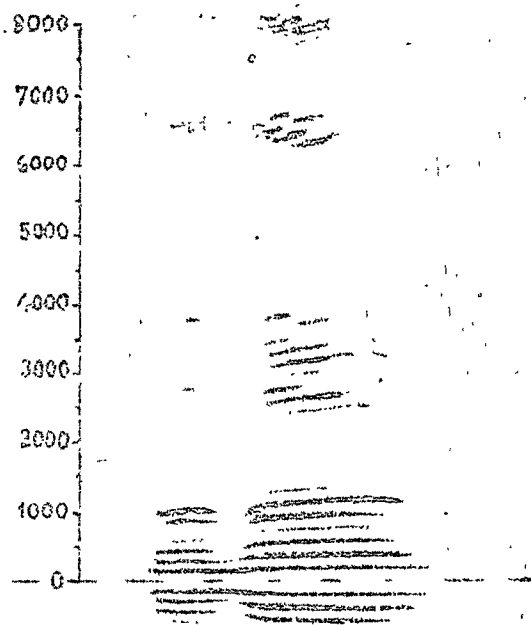some features different from the rest.

Figure 8
Mingogram of b and bh (RD).

A. Oscillogram.

B. Intensity curve.

C. Airflow curve.

Fig. 9b.
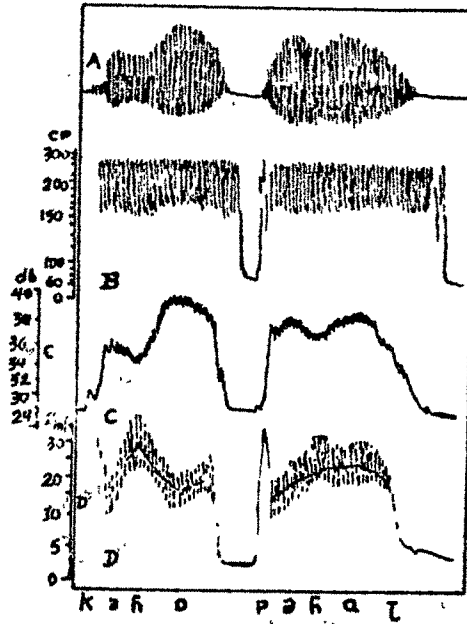
Narrow band spectrogram of
intervocalic h in por (RT).

Figure 10

Mingogram of intervocalic h
in ko, pac (RT).

A. Oscillogram.

B. Fundamental frequency curve.

C. Intensity curve.

D. Airflow curve.

Fig. 51 Mingograms of boṭū, taro, paṛ and boṭū, taro, paṛ (RD).

A. Oscillogram.

B. Fundamental frequency curve.

C. Logarithmic intensity curve, highpass filtered 315 cps.

D. Airflow curve.

Jørgensen has noted them as follows;

(1) 'RD has practically no difference'.. (between
the intensity of murmured vowels and clear
vowels). p, 102.

(2) RD has not only a longer distance to the peak
in murmured vowels but also a lower start and
a greater rise of the intensity curve. p, 103
(see figure 11 ) p.87

(3) RD has a higher intensity in all murmured
vowels, the others in most cases had a slightly
weaker intensity. p, 109.

(4) PBP (Pandit) PB and RD often have some common
features in their speech. Their oscillograms
of murmured vowels show more asymmetry. p, 113.

(5) RD's curves of murmured vowels are signs of an
incomplete fusion of [ h ] and vowel p, 115.

These, and several other remarks which I have not
quoted here (because that would mean quoting the full
explanation) atleast indicate clear demarcation between
different dialect speakers. To put it correctly it shows
that if 'murmur' is a feature borrowed by the speaker at
a later stage, it remains 'alien' in his speech to
some extent.

Jørgensen has summarized her work and given her
results on the physiological, acoustical and perceptual
level. On the physiological level a strong air flow

characterizes murmured vowels. This is due to the opening in the rear part of the glottis. A stronger activity of expiratory muscles is assumed by Jørgensen (we have noted that Kim has not only mentioned the spreading of the glottis but also the lowering of the glottis. This means an additional activity after the opening of the glottis). On the acoustical level she has recorded many important observations out of which we have noted longer duration, lower intensity, strong level of fundamental and asymmetry of oscillogram etc. All these features are correlated to open glottis.

Lastly, one very important observation of hers will have to be noted. She says "the difference between murmured and clear vowels in Gujarati is neutralized after aspirated consonants. The vowel found in this position is 'considered clear', (By Pandit and his followers)... but curves of vowels preceded by aspirated consonants spoken by PBP, P.B. and RD show a certain assimilation of the beginning of the vowel to [h] : the fundamental is stronger, the air flow stronger and there may be some noise at higher frequencies".[85] This stronger fundamental is clear in her figure. See figure no. 11 This observation indirectly extends proof to our thesis about murmur. It is an extremely crucial observation; unknowingly Jørgensen has refuted all earlier conclusions.

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85. Jørgensen, 1967, p. 116.

Jørgensen's research though not phonological turns
out to be very important for phonological solution. Her
phonetic results prove the inevitable importance of
phonetics to phonology.

## 1-2-5 Vyas' views

Lastly, one recent study by Vyas has to be
essentially noted as her dissertation is directly
connected with this issue.[86] She has correctly seen that
the murmuredness in Gujarati is the result of the specific
phonation type and that such a process should be described
as a prosody. But she is unable to get away from the notion
of 'contrast' when she says, 'the words show contrast
between normal voiced and whispery voiced vowels in
monosyllabic words.'[87] From these words she feels that it
is necessary to recognize six vowels [i̱], [u̱], [ɛ̱], [ɔ̱], [ɑ̱] and [a̱]
as whispery voiced'..[88] The very fact that she was unable
to get any contrast between [e̱] and [ɛ] and [o̱] and [ɔ]
should have made her search for the reasons of this.
Though her thesis is based on her own pronunciations she
often confuses the conclusions with alternative
pronunciations. Talking about 'whispery voiced plosives
[gʱ], [dʒʱ], [dʱ], [qʱ], [bʱ] she says "they can be pronounced with

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86. Vyas, 1978.

87. ibid, p.26.

88. ibid, p.36.

a clear vowel followed by the whispery release of the
consonant or, more commonly in my speech the vowel is
pronounced with whispery voice and final consonant has a
weak release. Thus [vag$^{ɦ}$] or [vag] "[89].

Vyas has also not got away from the Pandit type of
approach. She begins with Polysystemic approach but yet
she does not leave the past studies. There is a grave slip
in suggesting this type of alternative pronunciations. The
total disappearance of the final aspiration as indicated
here cannot be accepted. We have already discussed this
in detail. Aspiration has a lingering quality which is
observed by linguists in diachronic as well as syhchronic
data.

The speakers of the non-murmured dialect have tight
phonation and show conspicuous fortisness in their stops.
Secondly, it is surprising that the earlier studies did not
wonder as to how can the voiced aspiration of the stops get
lost totally in the final position when that same voiced
aspiration has expressed itself on a larger stretch of
speech i.e. on the adjacent-preceding-vowel. This is a
phonetic impossibility. This weird 'alternative
pronunciation' is the root cause of the whole confusion.
Vyas has noted the alternative pronunciation of /h/ giving
the following examples:

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89. Vyas,1978,P.36.

[ho̟i]   or   [o̠ i̟]   'combed'

[ kahan]   or   [ka̠n]   'krishna'

[vivah]   or   [ vi̠va]   'marriage' 90

This is an extension of the earlier mistake. She has
confused the dialect differences. Because of this the
significance of voiced breath due to [ɦ] is not brought
home to and hence the cause for murmured vowels is concealed.
As a result she has allotted "various sounds of Gujarati to
the different features characteristic of different kinds of
phonation at the phonetic level".[91] Later, she describes
words depending upon the number of syllables and the nature
of syllables. She also considers in detail, features which
characterise syllable initial, syllable final and the syllable
as a whole and shows how the clear phonation i.e. non-H
prosody and breathy phonation i.e. H - prosody spread in the
word. But what is the relevance of such a classification
when the main reason for the H-prosody has been missed? Her
allotment of the sounds to whispery voice is as follows:

vowels ə, a, i, u, ɛ, ɔ.

consonants gɦ, dɦ₃, dɦ, ɖɦ, bɦ 92.

Why has she not alloted this feature to voiced [ɦ] which can be
present medially? Having missed this crucial point the whole
classification of word/syllable prosody has become

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90. Vyas, 1978, p.42 .

91. ibid, p.61 .

92. ibid, p.62 .

misleading. She says "the sounds of section A 2-3 can be expected to be examples of breathy voice rather than merely examples of voice and whispery voice when they occur under conditions of heavy breathing or breathiness".[93]

See below:

$A_2$ : voiced stops : g, d₃, d, ɖ , b.

       nasals          : m, n, ɳ , ɲ , ŋ

       liquids        : l , r, ɭ

       fricatives    : s, ɦ

       clear and nasalized vowels : ə , a, i, u, o, ɛ , e, ɔ
                         ə̃, ã, ĩ, ũ, ɛ̃, ɔ̃.

$A_3$ : murmur vowels : ə , a, i, u, ɛ , ɔ

       consonants    : g̠, d̠₃, d̠, ɖ̠, b̠,[94]

But what happens in breathless condition or during heavy breathing in Gujarati can happen in any language! It has nothing to do with the issue of murmur. Vyas should have started afresh, then her prosodic approach would have certainly proved more explanatory.

1-3 Murmur : a prosodic process.
     Finally, we state few of our observations, suggestions and the thesis about the murmur.

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[93]. Vyas, 1978, p.62.

[94]. We have used the term voiced breathiness as a synonym for murmur. Vyas has used the term whispery voice for the same. Hence, her use of the term breathy voice should be considered distinct from my voiced breathiness".

To support the thesis we have extended a data of
more than three thousand words. The data is given in
Gujarati alphabetical order. All the possibilities of
the environments for murmur have been noted. Out of
3257 words given here only 897 words have murmured vowels.
The rest of the words don't have environments for
'murmur'. Nearly one fourth of the data show murmured
vowels. The environments clearly indicate that murmur
is due to voiced [ɦ] which

(a)    may be in a synthesized form as a component
of the voiced aspirated stops

(b)    or may be the manifestation of the
phoneme /h/

(c)    or may be the remnant of diachronic stage
as the old Gujarati words here indicate:

        [ tumɦe ]      'you'   (pl)

        [ əmɦe ]      'we'    (pl)

        [ maɦərəu ]   'mine'

        [ tumɦərəu ]  'yours'.

Some number words have peculiarly developed murmured
vowels.

    e.g. [ bɦə̃tter ] 'seventy two', [ tɦə̃tter] 'seventy three'
(ɦ) = intrusive

It should be noted that Marathi words for these two words
have [h] :

        [bahattər]

        [trahattər]

The fact is that murmured dialects are strongly
characterized by murmuredness. There is no possibility of
having any free variation mentioned by Pandit or Dave.
Murmur becomes so much a part of speaker's phonology that it
would be highly unnatural even to theoretically accept
such a free variation. What is implied here is that
though murmur appears to be a dialect specific phonomenon
it is not an idosyncratic phenomenon in the sense that the
voiced-breathiness of [ɦ] has a recurrent universal
nature and has to be considered as a 'natural' feature;
and it has a logical phonetic explanation. (We have
already noted the possibility of this feature in other
languages). In this sense it is independent of any
particular language structure. If [h] occurs in a sequence
in which a voiced segment precedes or follows it or both,
then it may take voicedness of these segments. Such 'ɦ' may
in turn transfer its voiced breath to its adjacent sounds. It
spreads regressively as well as progressively. Out of the
two components of [ɦ] (i.e. breath and voice) it is voice
that first becomes conspicuous due to the supporting
voicedness of the preceding/following voiced sounds and
as a result a continuum of 'voice' is created along with
which the transferred breath gets merged. The result is a
'murmur'. An excellent unbreakable continuum gets formed
when [ɦ] occurs initially. Perceptually speaking it is
difficult to say whether it is voiced 'ɦ + vowel' or it is a

murmured long vowel

e.g. [ hŏʰt ] 'lips'

[hɔdʒi] 'yet'

But medially [ ɦ ] is little more clearer and more easily recognizable:

e.g. [dəhən] 'burn' (n)

[məhən] 'great'

Murmuredness gives distinctness to some dialects of Gujarati. To put it differently these dialects have provided appropriate medium for the murmur-spread. Out of these dialects, some have very strong murmur (from Ahmedabad to Baroda area) and some have slightly weak murmur (from South Gujarat to Bombay area). Strong murmur dialects sometimes have murmur inspite of having no environments for it.

Here such data has not been worked out; hence we cannot conclude categorically. In my dialect (weak murmur dialect) there is no murmur in these words.[95] The reasons for the murmuredness in the large data in the appendix I, are same for both the varieties of murmur dialect.

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[95]. The data has been checked with the other speakers who speak the same dialect as mine; one of these speakers was Dr. Suresh Joshi, the most noted creative writer.

But the words noted below show intrusive 'ɦ' in

strong murmur dialect.

Set - I

| Strong murmur | weak murmur | |
|---|---|---|
| *[k ɦolled͡ʒ] | [kɔled͡ʒ] | 'college' |
| [b ɦari] | [bari] | 'window' |
| [b ɦarɳũ] | [barɳũ] | 'door' |
| [s ɦaʈhe] | [saʈhe] | 'a marathi surname' |
| [t͡ʃ ɦasɳi] | [t͡ʃasɳi] | 'syrup' |
| [s ɦasu] | [sasu] | 'mother-in-law' |

* Note that these words seem to be the result of

synchronic process.

The other set of data shows murmur in both the

dialects inspite of having no environments for murmur.

But these words seem to have developed murmur over the

period of development in language i.e., the diachronic

remnant of the aspirate element might have remained in the

form of murmur. Some of these words we have already listed.

Some more are given below:

Set - II

[s ɦaʈh] 'sixty'          [s ɦo] 'hundred'

[s ɦol] 'sixteen'          [p ɦasəʈh] 'sixty five'

[t͡ʃh ɦasəʈh] 'sixty six'

In this connection the diachronic development should be

noted. In pāli and prākrit 's' loses its proper articulation

and only 'aspirate' remains behind. Pischel has noted the

change of 's' to 'h' in prākrit and Hemchandra also refers to

such change.[95n.]

The position regarding murmur can be summarized as follows:

_____

96. Pischel, 1957, p. 219 (Hemchandra, 8:2: 74,75).

| Non-murmured dialects | Weaker murmur dialects | Strong murmur dialects |
|---|---|---|
| All the vowels are non-murmured and spoken with varying degrees of tight phonation, 'h' sound is voiceless. | The whole data in appendix I is common to both the types of dialects showing precise and natural phonetic reasons for murmur. In these dialects 'h' is always voiced. | The speakers of strong murmur dialect may show a tendency to speak murmur even when there are no environments for murmur. This is like a continuation of phonetic actuation of the phonation which has become a habit in the community. |
| | A speaker of weaker murmur dialect may lose 'voice' from 'ɦ' in some situations. But this is entirely an idiolectal feature. | |

96. a Bloch, 1965, p.67.

By giving two main dialect divisions having, (i) murmur

phonation and (ii) tight phonation, it is implied that

Gujarati speakers acquire (physiologically) two different

phonation habits. The murmur phonation is the result of

'voiced [ɦ]' which has created 'h-prosody'. Drastically

different from this is the  tight phonation where 'h'

remains voiceless. The glottis acquires very different

position from that required for murmur phonation.

Geographically speaking the tight phonation dialect area

is nearer to Kutch; and Kutchi language has also close

tight phonation. This observation is based on the

claim that I speak both Kutchi and one of the tight

phonation dialects quite well. I have felt the tension

of muscles near glottis while speaking these dialects.

Some preliminary experiments were carried out by taking

the tomograms for both the phonation types. The tomograms

of an Ahmedabad speaker (strong murmur dialect) and of a

Junagadh speaker (tight phonation dialect) display the

distinct positions of glottis. The photograph 1 shows

the position of glottis for the clear vowel where the glottis

is neither raised nor lowered but the photograph 2 shows

clearly the lowered glottis for murmured vowel as for the

word [bɦẽn]. The photograph 3 shows neutral position of

glottis. The photograph 4 shows the raised position of

glottis for the tight phonation of [i] 'that' in

Junagadh dialect. Here aryepiglottic folds have

contracted medially and the sublottalic angle is at the

Photograph I - Position of glottis for the clear vowel,

pronounced by the murmured dialect speaker.

Photograph II - Lowered position of glottis for murmured

vowel.

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1-3

Photograph III - Neutral Position of glottis.

Photograph IV - Raised position of glottis of the tight

phonation dialect speaker.

1-2

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2-2

right angle. Although this work is preliminary the photographs atleast prove that the 'murmur' in Gujarati is a laryngeal process; and interestingly enough Gujarati has two distinct phonations.

The data in appendix I shows that there is an overall regularity of environments for 'murmur'. However, the data in set I and II show some exceptions. It would be non-empirical not to take notice of such data and it would be like understimating the extent of exceptions to the regularity. To these exceptions, we propose an answer partly based on Chen and Wang's proposal.[97] According to them the sound change works on the language in a gradual manner thus remaining as an <u>ongoing</u> process which spreads from morpheme to morpheme in the most plausible manner.

Such phonetic processes exhibit certain cross-linguistic validity and the phonetic actuation. These processes also imply some constraint on human apparatus physiologically and perceptually. Where 'murmur' process spreads as in sets I and II, the physiological adjustment by lowering the glottis takes place. As Chen and Wang indicate the phonological rule extends its scope of operation in all relevant environments but more often than linguists have thought a phonological rule may cross the boundaries of defined pattern of environments and may spread in different ways. Such innovative spread may get regularized. In Gujarati examples here the relevant

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97. Chen and Wang, 1975, P. 255.

lexical diffusion is complete but the phonation habit
continues  to spread in new environments which seem-
ingly are exceptions.  However, they are the phonetic
actuations of phonation habit of lowering the glottis:
the speakers tend to do that in new environments too.
Moreover, such 'spread' provides the interesting data
for noting the 'change-process' in action.  The
extension of murmur in such 'not-expected' environments
has also socio-linguistic implications.  The murmur is
dynamically in action and often hyper-murmurization
activity is seen.

Murmur being a laryngealization process it has a
non-segmental behaviour.  This non-segmental behaviour
is a prosody which encompasses more than a single
segment and in Gujarati it often covers more than a
syllable.  This prosodic element does not affect the
segmental units, but it is not independent of the
segmental sounds.  It very much depends on 'h'.  This
'h' has a vowel like quality.  Moreover it has
inseperable association with the adjacent vocalicity.  Fant
has noted that "vowel like feature of 'h' will be 'zero-
free' which on the speech production level "implies non-
nasalized, non-lateral glottis source sounds, acoustically
correlated to the predictability of formant levels from
the F pattern... This would lead to the classification
of some whispered vowels and 'h' sounds as vowel like

and others as non vowel like".[98] The vowel likeness

creates prosody. We think we have been able to make our

point clear enough to consider murmur as 'a prosody'.

The statement about segmental phonemes and

prosodicity has to take a different shape. Listing

variants of segmental phonemes in distributional terms

can never take care of 'murmur'. Murmur spreading

over a syllable (or even more than a syllable) cannot

get confined to a single segment point. As Firth has

said... "the syllabic prosodies of word is *anima vocis*,

the soul, the breath, the life of the word".[99] Firth

also sees the scientific convenience in regarding 'h'

as belonging to the prosodic system. 'h' of Gujarati

can be the phonematic unit as well as can be the prosody.

The phonation effect though simultaneous with the segmental

units has not a segmental length. It lingers over a

full syllable or even more than that: All this answers

the doubtful issues of Divetia, Pandit and Dave. It

would be justified if we say that,

(1)  there is no reason to hunt for the contrasting

     pairs between the murmur and the clear vowels.

(2)  voiced aspirated stops are as much as cause for

     the murmuredness of the vowels as the [ɦ]

     fricative is. Hence, there is no logical

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98.  Fant, 1962, p. 14.

99.  Firth, 1957, p. 123.

basis to consider them as sequences (clusters) of stop + h. Infact they are very much contrasting with their respective voiceless aspirated and voiced/voiceless unaspirated stops, in every sense of the term 'contrast'. They induce murmur prosody in the adjacent vowels but in their own right they have the unit status.

(3) murmur means an adjustment of glottis and expansion of oral cavity. This in turn results in lowering of the jaw which may lower the mid vowels (dialectically.)

(4) the occurrence of the murmur causing environments (i.e.[ɦ] or voiced aspiration of voiced aspirated stops) depend on

(a) with which consonant/vowel the syllable begins or ends.

(b) which vowel precedes or follows them.

This delimits the freedom of occurrence of these murmur causing environments e.g. In a word beginning with [k] followed by [ə] only one voiced aspirated stop [dɦ] can follow [ə]. We have listed the distributional possibilities below:

| First syllable | Murmured | |
|---|---|---|
| # k + | ə + | $q^ɦ$ |
|  | a + | $q^ɦ$, ɦ.. |
|  | o + | $q^ɦ$ + ɦ .. |
|  | u + | ɦ.. |
| # $k^h$ + | ə + | $b^ɦ$ |
|  | a + | $d^ɦ$ |
|  | o + | ɦ, $b^ɦ$ |
| # g + | ə + | $q^ɦ$, $d^ɦ$, $b^ɦ$, ɦ |
|  | a + | $q^ɦ$, $d^ɦ$, $b^ɦ$ |
|  | o + | $dʒ^ɦ$, $d^ɦ$, ɦ |
|  | i: + | $d^ɦ$ |
|  | u + | ɦ, $q^ɦ$ |
|  | e + | ɦ |

*# $g^ɦ$ All the words irrespective of the following
consonant/vowel will have murmured vowels because the
words begin with $g^ɦ$ (vd. Asp. stop).

| First syllable | Murmured | |
|---|---|---|
| # tʃ + | ə + | $q^ɦ$, $b^ɦ$ |
|  | a + | ɦ |
|  | o + | $g^ɦ$ |
|  | i: + | $q^ɦ$, ɦ, $b^ɦ$ |
|  | e + | ɦ |
| # $tʃ^h$ + | o + | $b^ɦ$, ɦ |
|  | e + | ɦ |
| # dʒ + | ə + | $g^ɦ$, ɦ |
|  | a + | ɦ |
|  | o + | ɦ |

| First syllable | Murmured | |
|---|---|---|
| ⚌ dʒ $+$ | i: $+$ | $b^{ɦ}$, ɦ |
|  | u $+$ | $d^{ɦ}$, ɦ |
|  | e $+$ | ɦ |
| * ⚌ dʒ$^{ɦ}$ | | |
| ⚌ ʈ $+$ | ə $+$ | ɦ |
|  | a $+$ | $ɖ^{ɦ}$, $b^{ɦ}$, ɦ |
|  | e $+$ | $ɖ^{ɦ}$ |

* applies to all voiced aspirated stops.

| | | |
|---|---|---|
| ⚌ ʈ$^{h}$ : | ∅ | |
| ⚌ ɖ $+$ | ə $+$ | $g^{ɦ}$, $b^{ɦ}$, ɦ |
|  | a $+$ | $g^{ɦ}$, $b^{ɦ}$, ɦ |
|  | o $+$ | $g^{ɦ}$, $ɖ^{ɦ}$ |
|  | u $+$ | $g^{ɦ}$ |
| * ⚌ ɖ$^{ɦ}$ | | |
| ⚌ t $+$ | ə $+$ | $g^{ɦ}$, $d^{ɦ}$, ɦ |
|  | u $+$ | ɦ |
| ⚌ t$^{h}$ $+$ | a $+$ | ɦ |
|  | o $+$ | $b^{ɦ}$ |
| ⚌ d $+$ | ə $+$ | dʒ$^{ɦ}$, $d^{ɦ}$, ɦ, |
|  | a $+$ | $g^{ɦ}$, d $^{ɦ}$, $ɖ^{ɦ}$, ɦ |
|  | o $+$ | $ɖ^{ɦ}$, ɦ |
|  | i $+$ | $d^{ɦ}$ |
|  | u, u: $+$ | dʒ$^{ɦ}$, $d^{ɦ}$, $b^{ɦ}$, ɦ |
|  | e $+$ | ɦ |

| First syllable | Murmured | |
|---|---|---|
| # p + | ə + | ɦ |
| | a + | gɦ, dɦ, ɦ |
| | o + | ɖɦ, ɦ |
| | i + | ɦ |
| | i: + | ɖɦ, dɦ, ɦ |
| | u + | ɖɦ |
| | e + | ɖɦ |
| # f | ø . | |
| # b + | ə + | dʒɦ, ɖɦ, ɦ |
| | a + | gɦ, dʒɦ, ɖɦ, dɦ, ɦ |
| | o + | gɦ, dɦ, |
| | i + | bɦ |
| | u + | dʒɦ, ɖɦ, dɦ, bɦ |
| | u: + | gɦ, dʒɦ, ɖɦ, dɦ |
| | e + | ɦ |
| * # bɦ | | |
| # m + | ə + | gɦ, dʒɦ, ɖɦ, dɦ, ɦ |
| | a + | gɦ, dʒɦ, ɖɦ, dɦ, ɦ |
| | o + | gɦ, dʒɦ, ɖɦ, bɦ, ɦ |
| | i + | ɦ |
| | i: + | ɖɦ |
| | u + | gdɦ, dʒɦ, ɖɦ, ɦ |
| | u: + | ɖɦ |
| | e + | gɦ, ɖɦ, dɦ, ɦ |
| # j + | ə + | ɦ |
| | a + | ɦ |
| | o + | dɦ |
| | u + | dɦ |

| First syllable | | Murmured | | |
|---|---|---|---|---|
| # r | + | ə | + | $g^ɦ$, $dʒ^ɦ$, $ɖ^ɦ$, $b^ɦ$, ɦ |
| | | a | + | $g^ɦ$, $ɖ^ɦ$, $d^ɦ$, $b^ɦ$, ɦ |
| | | o | + | $ɖ^ɦ$, $d^ɦ$, ɦ |
| | | i | + | $dʒ^ɦ$, $d^ɦ$, ɦ |
| | | i: | + | $dʒ^ɦ$, $ɖ^ɦ$, |
| | | u | + | $dʒ^ɦ$, $ɖ^ɦ$ |
| | | u: | + | $dʒ^ɦ$, $ɖ^ɦ$, ɦ |
| | | e | + | $ɖ^ɦ$ |
| # i | + | ə | + | $g^ɦ$, $ɖ^ɦ$, $b^ɦ$, ɦ |
| | | a | + | $g^ɦ$, $d^ɦ$, $b^ɦ$, ɦ |
| | | o | + | $ɖ^ɦ$, $d^ɦ$, $b^ɦ$, ɦ |
| | | i: | + | $b^ɦ$, ɦ |
| | | u | + | $b^ɦ$, ɦ |
| | | e | + | $b^ɦ$, ɦ |
| # v | + | ə | + | $ɖ^ɦ$, $d^ɦ$, ɦ |
| | | a | + | $g^ɦ$, $ɖ^ɦ$, ɦ |
| | | i | + | $g^ɦ$, $d^ɦ$, $b^ɦ$, ɦ |
| | | i: | + | $g^ɦ$ |
| | | e | + | $ɖ^ɦ$, $d^ɦ$, ɦ |
| # ʃ | + | ə | + | ɦ |
| | | a | + | ɦ |
| | | o | + | $d^ɦ$, $b^ɦ$ |
| | | i | + | ɦ |
| | | i: | + | $g^ɦ$, $d^ɦ$ |
| | | u | + | $d^ɦ$, $b^ɦ$ |

| First syllable | | Murmured | | |
|---|---|---|---|---|
| ∫ | + | u: | + | $d^{ɦ}$ |
| | | e | + | $ʈ^{ɦ}$, $ɦ$ |
| ✳ s | + | ə | + | $g^{ɦ}$, $ʈ^{ɦ}$, $d^{ɦ}$, $b^{ɦ}$, $ɦ$ |
| | | a | + | $ʈ^{ɦ}$, $d^{ɦ}$, $b^{ɦ}$, $ɦ$ |
| | | o | + | $ʈ^{ɦ}$, $b^{ɦ}$, $ɦ$ |
| | | i | + | $dʒ^{ɦ}$, $d^{ɦ}$ |
| | | i: | + | $dʒ^{ɦ}$, $d^{ɦ}$ |
| | | u | + | $g^{ɦ}$, $dʒ^{ɦ}$, $d^{ɦ}$, $b^{ɦ}$, $ɦ$ |
| | | u: | + | $dʒ^{ɦ}$, $d^{ɦ}$ |

The above list clearly indicates the limited distribution of 'breathy vowels'. When voiceless unaspirated stops are in the initial position ( [ k, tʃ, ʈ, t, p] ), the possibilities of murmur causing environments are less than when the voiced unaspirated stops [ g, dʒ, ɖ, d, b] are in the initial position. When voiceless aspirated stops are in the initial position the said possibilities are even less e.g. in case of [ ʈʰ, (pʰ)] the possibility is zero. When [ 1, r,v,j,s,ʃ] and [ m, n] are in the initial position, the possibilities are many more. We can roughly say that murmur is caused by 'voiced breath' and 'voiced breath' expresses itself more fully and freely. When voiced sounds (voiced stops, liquids, nasals, and sibilants) are around. This expression is indicative of a highly

natural phonetic phenomenon. First of all 'h' as a

laryngeal production gets voiced 'ɦ' in the 'voiced

environments' and transfers 'voiced breath' to the

same vowels which are responsible in making it

'voiced' ! It thus is the cause for 'murmuredness

of the vowels but at the same time the 'voice'

prosody is implied: in the sense that 'voiced breath'

is more easily transferred when the consonants too are

voiced! We get convinced of the requirement of seeing

beyond a sound segment. As Firth has again and again

insisted we have to accept that "whatever units we may

find in analysis must be closely related to the whole

utterance, and that is achieved by systematic state-

ment of the prosodies."¹⁰⁰ In the perception of speech

by the listener whatever units there may be are

prosodically reintegrated".

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100. Firth, 1957, p. 138.