INTRODUCTION
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An explanatory phonology of the Deccani Urdu of Hyderabad, as presented in this thesis, is based on the speech of artisans, craftsmen, and unskilled laborers of the old city of Hyderabad, particularly those living in the localities around the Charminar, the famed Qutb Shahi tower with the four minarets. The analysis is carried out in the theoretical framework of the Columbia school of linguistics.

The introduction here is devoted to providing proper perspective for the phonological research presented in this thesis. This is done in four sections. In section A, we deal with the historical setting of Hyderabad Urdu. In section B, we describe the field procedures utilized in the collection and analysis of the data. In section C, we present an outline of the theoretical principles that motivate the phonological analysis. In section D, we specify the scope of the present analysis.

Section A: Historical setting of the Deccani Urdu of Hyderabad

The City of Hyderabad, now the state capital of Andhra Pradesh, was founded on the River Musi, five miles east of Golconda, in 1590-91 by Sultan Muhammad Quli Qutb Shah. The City with a history of four hundred years is now the fifth largest city in India with a population of two and a half millions. It is perched on the top of the Deccan Plateau, 1776
feet above the sea level, and sprawls over an area of 100 square miles.

The City of Charminar has been described as the Panchavani Sangam, a place where five linguistic and cultural streams meet. For Telugu, Marathi, Kannada, Tamil and Urdu have harmoniously mingled to enrich this city famous for its Nawabi traditions and graciousness.

The twin cities of Hyderabad and Secunderabad are separated by Husain Sagar, an artificial lake constructed in 1562 by Husain Shah Wali, during the reign of Ibrahim Quli Qutb Shah.

In the 16th century, the city grew spontaneously to accommodate the surplus population of Golcunda, which was the capital of the kingdom of Golcunda (1512-1687) under the Qutb Shahi dynasty. Many buildings sprang up along the River Musi and gradually the City of Hyderabad grew.

The poet king of Golcunda, Sultan Muhammad Quli Qutb Shah, while laying the foundation of this historic city, prayed thus to the Almighty God:

mera: jAhr lo:ga:n su:ma:n mu:r kAr
rAk:ya: ju:n tu: dArya: me: mA:n, ya: sAmi:
The kingdom of Golcunda was one of the five Muslim Kingdoms that flourished in South India, when the Mughal empire was firmly established in North India. Many rulers of these kingdoms were patrons of music, literature, and architecture. The Qutb Shahi kings of Golcunda particularly excelled in patronizing learning, and they were great builders as well. They contributed to the growth and development of Indo-Persian and Indo-Islamic literature and culture in Hyderabad. Further, they also patronized regional culture of the Deccan, symbolized by the Telugu language.

Finally, it may be noted that whereas Persian continued to be the vehicle of literary expression and enjoyed the status of the court language under the Great Mughals, the Qutb Shahi's patronized Urdu to the extent that besides being their court language, it became the medium of literary expression in the 16th and 17th centuries. In fact, Sultan Muhammad Quli Qutb Shah was himself a prolific poet of Urdu, and is regarded one of the best poets of the Deccan, before the development of Urdu literature in North India in the 18th century.

The glory of Golcunda ended in 1687, after a valiant struggle. Aurangzeb, the last of the great Mughal rulers, captured Golcunda after defeating Abul Hasan Tana Shah, the last king of Golcunda, who was imprisoned at Daulatabad.
near the Mughal capital of the Deccan at Aurangabad. Golcunda thus became part of the Deccan province of the Mughal empire.

After the death of Aurangzeb in 1707, Deccan was administered by a Subedar or Governor of the Mughal emperor. With the decline of the Mughal power, Mir Qamruddin Khan, the Governor of the Deccan, who bore the Mughal title of Nizam-ul-Mulk Feroze Jung Asaf Jah, established his supremacy in 1724. He thus became the first Nizam as the founder of the Asaf Jahi dynasty in the Deccan.

Asaf Jah I continued to maintain Aurangabad as the capital of his new state. In 1763, Nizam Ali Khan Asaf Jah II shifted the capital to Hyderabad. Soon afterwards, the Nizam's dominions in the Deccan became synonymous with the name of this city, for they came to be known as the Hyderabad State. The seven Nizams of the Asaf Jahi dynasty ruled the Deccan for nearly 225 years right up to 1948, when the Hyderabad State acceded to become part of Independent India.

When the British East India Company spread their hold over the country in the second half of the 18th century, the Nizam of Hyderabad soon won their friendship while still maintaining much of his sovereign authority. This relationship lasted to the very end of the British rule in India. Thus, the
title 'Faithful Ally of the British Government' was bestowed on Nizam VII, the last ruler of the Hyderabad State.

Like the kings of Golcunda, the Nizams of Hyderabad patronized Urdu language and literature. Urdu flourished as the official language of the Hyderabad State. This language also became the medium of instruction for higher education at Osmania University in Hyderabad. Further, the State patronized a great deal of research on Urdu language and literature in general, and on the Qutb Shahi literature in particular.

As the state capital of Andhra Pradesh, Hyderabad continues to be an important center of Urdu in the Republic of India. In fact, Urdu enjoys the status of the second state language after Telugu in Andhra Pradesh. As Hyderabad Urdu has been nurtured in a different linguistic and cultural milieu, this Deccani dialect of Urdu has acquired some distinctive phonological, grammatical, and lexical characteristics in comparison with the North Indian Urdu, and these distinctive features need to be thoroughly studied, particularly with the outlook of India as a linguistic area. Furthermore, the study of the Deccani Urdu of Hyderabad in its historical setting may also contribute to a better understanding of the origin of Urdu and Hindi as Indo-Aryan languages. The research undertaken in this thesis is aimed at a comprehensive phonological analysis of the Deccani Urdu of Hyderabad.
Section B: Field Procedures: The Collection and Collation of Data

The data for the present phonological analysis has been collected through fieldwork in the Charminar neighborhood of the City of Hyderabad. The native informants of this dialect of Deccani Urdu were carefully selected for the elicitation of the data.

For the purity and uniformity of data, we decided at the outset to study the speech of essentially illiterate persons—the artisans, the craftsmen, and the unskilled laborers—representing a cross section of the speech community in the old city of Hyderabad. The following native speakers were chosen to be our main informants for the collection of data:

<table>
<thead>
<tr>
<th>Name</th>
<th>Sex</th>
<th>Age</th>
<th>Occupation</th>
<th>Locality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athar Belal</td>
<td>Male</td>
<td>45 years</td>
<td>Laborer</td>
<td>Kalikaman</td>
</tr>
<tr>
<td>Zahid Hussain</td>
<td>Male</td>
<td>52 years</td>
<td>Banlga maker</td>
<td>Lad Bazar</td>
</tr>
<tr>
<td>Chand Bibi</td>
<td>Female</td>
<td>42 years</td>
<td>Bangle maker</td>
<td>Lad Bazar</td>
</tr>
<tr>
<td>Noor Fatima</td>
<td>Female</td>
<td>38 years</td>
<td>Embroidery maker</td>
<td>Patthargatti</td>
</tr>
</tbody>
</table>

It may be noted that although these informants lack formal education, they are familiar with the Urdu alphabet, and can read the holy Qur'an. Further, all these informants belong to the lower social strata of the Urdu speaking community so far as their income, occupation, and cultural heritage is concerned. It may also be noted that all the four informants that we have so carefully chosen, possess distinct and audible voices characterized by clear pronunciation.
Furthermore, it may be pointed out that our data collection process has been based on face to face interviews with the informants in their own localities, in various sittings, running into hours.

At the beginning, we made a non-restrictive collection of words, as they appear in the everyday speech of the informants, both in isolation and in the larger context of phrases and sentences. Soon afterwards, we embarked on an exhaustive collection of data, but limited it to all and only the monosyllabic words in the active vocabulary of a typical speaker of Hyderabad Urdu. This was mainly accomplished in two ways: (1) By a meticulous informant work with reference to objects and artifacts, person and profession, kith and kin, rituals and customs, and other ways of life in the community. (2) By using John T. Platts' monumental Dictionary as a potential guide for the elicitation of the monosyllabic words actually utilized in the Deccani Urdu of Hyderabad. Besides a complete collection of the monosyllabic words, we have also collected a large number of disyllabic and longer words for exemplification in support of our analysis. In fact, we have made an extensive use of the disyllabic and longer words throughout the thesis in validating our phonological analysis.

It is to be noted that each word of the data was recorded on a separate index card. Care was taken to record all the words at first in narrow transcription, with every discernible
phonetic detail for each segment of the word. On the basis of that data in narrow, phonetic transcription, we, then, established the phonemic inventory of the Deccani Urdu of Hyderabad in terms of the criteria generally followed in traditional American phonemics. The establishment of the phonemes, while still in the data collection process, enabled us to also write all the collected words on the index cards in broad, phonemic transcription.

Finally, it may be noted that an exhaustive collection of the monosyllabic words was made particularly to be a means to provide statistical support for the validity of the present phonological analysis. For we could clearly see that the phonological units or the "phonemes" established for the Deccani Urdu of Hyderabad are not equally utilized in the formation of words. Rather, there are sharp skewings in the distribution of these units in various positions and various combinations within the word.

We therefore made full use of the analysis pad which contains graph sheets. First, all the CVC words were plotted on the graph sheets. We used separate graph sheets for each initial consonant of these words. In each graph sheet, we then filled the slots for all those CVC words that begin with a particular initial consonant, followed by all the vowels in horizontal order and all the final consonants in vertical order. This enabled us to calculate the frequency of occurrence for
all the phonological units that appear in the CVC words, both horizontally and vertically. Then, we made use of additional graph sheets to determine the frequencies of the phonological units in the various positions of the other two types of the monosyllabic words, i.e., the CVCC words and the CCVC words, separately. The figures so obtained provide a quantitative basis to prove the favoring of certain phonological units over some others in the validation of the analysis for Deccani Urdu, as for any other language or dialect.

**Section C: Theoretical Background**

The phonological analysis of Hyderabad Urdu presented in this thesis, is based on the theoretical framework of the Columbia school of linguistics. Although the origin of this theory can be traced back to Ferdinand de Saussure's *Cours de linguistique générale* (1916), the theory has fully been developed by Professor William Diver and his students at Columbia University. It may also be noted that N.S. Trubetzkoy of the Prague school has also been an important source of inspiration for the Columbia school, particularly for its phonological theory. Furthermore, in the development of

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1 Inasmuch as we have extensively incorporated Professor William Diver's ideas about language from both his lectures and his published and unpublished works throughout this thesis, it has not been possible for us to give proper references. But we will ever remain indebted to the noted Columbia University scholar for utilizing his concepts in our research. At the same time, we must take full responsibility for any misrepresentation of Professor Diver's theoretical viewpoint in the present research.
the Columbia school theory, Professor Diver has also greatly benefited from his teacher Professor Andre Martinet.

A brief account of the Columbia school linguistic theory, with particular reference to phonology, is presented in seven sections. In section C1, we characterize linguistic theory as containing three interrelated components: the orientation, the hypothesis, and the observable phenomena. In section C2, we outline briefly the role of the orienting principles in the make up of the theory of phonology, in relation to the phonological hypotheses and the phenomena (the sound waves of speech). In section C3, we present the concept of ‘double articulation of language’ to distinguish phonology from grammar. In section C4, we introduce the concept of the phonological grid, in contradistinction to the traditional ‘inventory of phonemes’. In section C5, we highlight the importance of both ‘substance’ and ‘value’ in phonological analysis. In section C6, we deal with the ‘syntagmatic' versus ‘paradigmatic' relations in phonology. In section C7, we outline the procedures for the validation of phonological analysis.

Section C1: Linguistic Theory: The Orientation, the Hypothesis, and the Phenomena

Like any other scholarly discipline, the study of language consists of three parts: the orientation, the hypothesis, and the observable phenomena. In this tripartite
organization of the discipline, the hypothesis occupies a central position. For the task of the investigator is limited to demonstrating that the hypothesis he postulates (e.g., a five-vowel system for a language) fits with the observable data (the associated speech sounds) on the one hand, and is consistent with the orienting principles (e.g., the communicative intent) on the other. The term 'linguistic theory' will be used to indicate the overall relation among these three parts. It may also be noted that the linguistic theory itself consists of two sub-theories: the phonological and the grammatical.

Section C2: Orienting Principles for the Theory of Phonology

"It is well-known that language is used by human beings to communicate messages and that these messages are imparted by means of signals that are produced by the speaker through various manipulations and configurations of the vocal tract and are transmitted to the hearer through an acoustic medium". (Azim, 1978:6.) The signals produced by the visible vocal organs, such as labia, can also be perceived through eyes. It is these common facts about the character of language that provide five orienting principles for the study of language: (a) communication, (b) physiological mechanism, (c) acoustic medium, (d) human behavior, and (e) vision. Although only two of these principles, namely, communication
and human behavior, are directly relevant to the study of grammar, all the five orienting principles together provide the setting for the study of phonology with which the present analysis is associated.

It is noteworthy that these five orienting principles are independently known and verifiable. For these principles are true to other real world phenomena, irrespective of language. For instance, physiology of the vocal tract is as valid for the production of the speech sounds, as it is for other biological functions, such as, eating, chewing tasting, smelling and breathing.

The role of the five orienting principles in the make-up of the phonological theory, is outlined in five sections below.

Section C2(a): Communication

It will be generally agreed that language is fundamentally a device of communication. As we know, devices of communication, such as traffic lights or Morse code, transmit messages by means of signals. Thus, in a traffic light system, the signal green means 'go', yellow indicates 'caution', and red signals 'stop'. Likewise, particular signals or forms (signifiants) in association with their meanings (signifies) partake as units in the grammatical systems of a language. These signal-meaning units, referred to as signes by Ferdinand de Saussure, are therefore considered the basic units of grammar. However, it is to be
noted that communication also plays an equally important role in phonology.

As an orienting principle, communication justifies the use of meaning for establishing the phonological units of a language by contrast through minimally distinctive pairs of words. In fact, this is the procedure that is generally utilized in the American descriptive phonemics for establishing the 'phonemic inventory' of a language. It may however be noted that the American phonemicists establish the phonemes formally through distributional-substitutional criteria, and use the meaning-based procedure only as a short-cut for discovering the phonemes. On the contrary, we accept as our phonological units all the phonemes discovered by contrast through minimal pairs. For the principle of the 'phoneme', based on the distinctiveness of meaning, may be considered one manifestation of the communicative orientation of language.

Further, it may be noted that the communicative principle also affects the distribution of phonological units in the various positions of the word. It will be readily accepted that the beginning of the word carries a greater communicative load than the end of the word. In terms of this communicative rationale, we expect that a greater number of phonological units will be utilized in word initial position, whereas there will be a selective under-utilization of the phonological units of a
language in word final position. In fact, the classical case of the loss of distinction of voice in German and Russian in the final position of the word, can best be explained in terms of communicative load. It may be noted that the concept of communicative load was introduced by Andre Martinet under the term 'functional load'.

Section C2(b): Physiological Mechanism

Physiological mechanism as an orienting principle of phonology, highlights the role of the physiology of the vocal tract in the production of speech sounds. Humans are endowed with an improved sound producing mechanism (the vocal tract) as a result of which they are able to produce a large number of sounds by various manipulations and configurations of the vocal tract.

The basic physiological parameters that have a direct bearing on the theory of phonology, are presented in seven subsections below.

Section C2(b)(i): Articulators and Apertures

The articulators and the apertures are the devices of sound production based on the physiology of the vocal tract. The articulators are the adroit vocal organs; the apertures represent the various degrees of vertical openings of the vocal tract that are brought about by the movement of the lower jaw. The articulators combine with the degrees of
aperture to shape, and in some instances also to excite, the vocal cavity in the production of speech sounds.

The adroit vocal organs that function as articulators in the production of speech sounds, are: the labia, particularly the lower lip (producing labial sounds--p f w etc.); the apex, or blade, of the tongue (producing apical sounds--t s l r etc.); the medium of the tongue (producing medial sounds--c ñ y etc.); the dorsum of the tongue (producing dorsal sounds--k x etc.); and the post dorsum or the root of the tongue (producing post dorsal sounds, such as Arabic q); the velum, when it opens the nasal cavity for the production of the nasal sounds (m n etc.); and the glottis, i.e., the vocal folds as the glottal articulator (producing glottal sounds, such as glottal stop and h). The pharynx may also be counted as an articulator, for the musculature of its walls can bring about the production of 'pharyngeal fricatives' as used in Arabic.

The apertures, i.e., the vertical openings of the vocal tract in relation to the associated articulators, range from the total closure to the maximum opening. The degrees of aperture may be characterized as follows:

Aperture 0: Complete stoppage of the stream of air coming from the lungs by an articulator and then the excitation of the vocal cavity by explosion, as in the production of p t k etc.
Aperture 1: Partial stoppage, so that air is forced between the articulator and the place of articulation, their surfaces in contact, exciting the cavity by frictional turbulence, as in the production of f and theta, etc.

Aperture 2: No stoppage, but the articulator forms a sufficiently narrow constriction so that it can control the air stream coming from the lungs, and thus excites the vocal cavity by channel turbulence, as in the production of s, x etc.

Aperture 3,4,5,6 etc.: The articulators are used to produce resonant cavities with successively larger degrees of aperture. Aperture 3 is utilized in producing what are traditionally known as the 'liquids'—y r l w etc., whereas apertures 4 and above are used in the production of the vocalic sounds, traditionally known as 'vowels', e.g., iː uː eː oː aː.

The apertures may be classified into two broad divisions: Constrictions versus Openings and Clearly Audible versus Less Clearly Audible; the distinguishing character of these two divisions is taken up in the following subsections.

Section C2(b)(ii): Constrictions versus Openings

As pointed out above, apertures ø,1 and 2 are formed in such a way that there is a closer contact between the surfaces
of articulators and the associated places of articulation. In view of their constrictive character, these apertures can produce turbulence for exciting the vocal cavity. As a result, articulators both shape and excite the vocal cavity in the production of speech sounds at all these apertures. Apertures zero through 2 may therefore be termed constrictions or constriction apertures.

Although both voiceless sounds (p f, t s, etc.) and voiced sounds (b v, d z, etc.) are produced at the constriction apertures, it must be pointed out here that the production of the voiced speech sounds is an added complexity at these apertures. For it requires an additional excitation of the vocal cavity through the vibrations of the vocal folds, thus necessitating the use of an extra articulator, the glottis.

In contradistinction to constriction apertures (zero through 2), the larger apertures (3 and above) are termed opening apertures or openings. As the opening of the vocal tract is too large to produce turbulence at these apertures, the supraglottal articulators only shape the vocal cavity, but they cannot excite it. It is the glottis as an articulator that excites the supraglottal cavity through voice by setting the edges of the vocal folds in vibration. Thus, voicing becomes a necessary concomitant for the production of speech sounds, both 'liquids' and 'vowels', at the opening apertures.
Section C2(b)(iii): Clearly Audible versus Less Clearly Audible Apertures

Besides constrictions versus openings, as pointed out earlier, the apertures lend themselves to one more broad division. This division of apertures is based on the acoustic criterion of audibility. Apertures 0 through 3, which are associated with the production of consonantal sounds, are referred to as the less clearly audible apertures. In contradistinction, apertures 4 and above, which are ideally suited for the production of vocalic sounds, are termed the clearly audible apertures. (For details, of Chapter I, Diagram I-1, comment 4, and Chapter V, section A.)

Section C2(b)(iv): Role of the Larynx in the Production of Speech Sounds

Larynx contains the glottal articulator, namely, the vocal folds, perhaps the most important of all the vocal organs that partake in the production of speech sounds. The vocal folds “are two parallel transverse banks or bands extending from front to back” from the thyroid cartilage. (Bloch and Trager, 1942:16.) Being extremely adroit, the vocal folds may assume many glottal configurations to produce a variety of speech sounds. Thus, they bring about the production of the glottal stop and the glottal h, besides generating “voice”, the various pitch levels, and aspiration.
In Urdu, three basic units, namely, the V(oicing), the voiceless A(spiration), and the voiced h, are produced by the glottal articulator. It is noteworthy that these three units play a significant role in the production of supraglottal phonological units in Deccani Urdu, as in other dialects of Urdu. This will be taken up, when we comment on the phonological grid of Deccani Urdu in Chapter I.

**Section C2(b)(v): Hierarchy of the Adroitness of Lingual Articulators and the Relative Adroitness of the Labium**

Different parts of the tongue—apex, medium, dorsum, and post dorsum (or root)—vary in their degrees of adroitness. For they significantly differ from each other in their structure and musculature.

The apex, the most adroit among the lingual and all other supraglottal articulators, has a thin and lightweight structure, highly flexible musculature and a triangular shape, containing the blade with the tip. As a result, the apex may be moved freely across the length and breadth of the vocal tract. In contrast, the post dorsum, or root, of the tongue, being thick and massy in musculature, is the least adroit among the lingual articulators. For it is hinged to the back of the oral cavity, and functions as a hilt to the tongue in general and to the dorsum in particular. As for the dorsum and the medium, they are alike in that they both have a massy structure and a
rectangular shape. But in terms of the degrees of adroitness, the medium has to be placed below the dorsum. For whereas the dorsum has a relatively more flexible musculature, the medium, with its slightly tighter muscles, functions as a hilt to the apex.

In terms of the degrees of adroitness postulated above, we may place the four lingual articulators on the scale of adroitness, as presented in Diagram 0-1.

<table>
<thead>
<tr>
<th>Lingual Articulators</th>
<th>Degrees of Adroitness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apex</td>
<td>Most Adroit</td>
</tr>
<tr>
<td>Dorsum</td>
<td>More Adroit</td>
</tr>
<tr>
<td>Medium</td>
<td>Less Adroit</td>
</tr>
<tr>
<td>Post Dorsum (or the Root)</td>
<td>Least Adroit</td>
</tr>
</tbody>
</table>

Diagram 0-1: Scale of Adroitness of Lingual Articulators

It may be noted that the impact of this scale of adroitness is limited to only the consonants. In terms of the scale, we expect that in a language or a dialect, the most adroit apex will be most productively utilized in the formation of the consonantal units, and in their frequency of occurrence in the word. On the contrary, we expect that the least adroit post dorsum may only occasionally be utilized in language to form a consonantal unit, such as the post dorsal q in modern standard Urdu. Further, we expect that such a post dorsal consonant may have a low frequency of usage in the word.
The dorsal ("velar") consonants (k g x y etc.), and the medial ("palatal") consonants (c j ʃ etc.), produced by the more adroit dorsum and the less adroit medium respectively, may occupy the middle ground with regard to the number of units and the frequency of their usage. Of these two types of consonantal units, we expect, in terms of the scale, that the dorsal consonants may be preferred over the medial consonants.

Finally, a word about the de facto placement of the labium on the scale of adroitness for lingual articulators. It is well known that the labia as an articulator play an important role in the production of speech sounds, both consonantal and vocalic. But here, our approximate placement of the labium on the scale of adroitness is relevant to the analysis of only the labial consonants vis-a-vis the apical, the dorsal, the medial, and the post dorsal consonants.

As the labia are a highly flexible articulator with a fleshy musculature, and as the lower lip has a wide vertical range with the movement of the lower jaw, the labial articulator may well be placed somewhere near the dorsum on the scale of adroitness of articulators. For in terms of the physiology, the labium is certainly less adroit than the apex, and more adroit than the medium.
Section C2(b)(vi): The Medium-Dorsum Mass as the Articulator for Vowels

As outlined above, the apex is the most commonly used lingual articulator for the production of consonantal speech sounds. But with its triangular shape, smaller size, and lightweight structure, the apex is not suited to produce the clearly audible, vocalic sounds.

In contradistinction to the apex, the medium-dorsum of the tongue have a massy structure and a wide rectangular shape. Physiologically, therefore, the medium-dorsum, in combination with the labia, are ideally suited for the formation of supraglottal resonant cavities, which is a necessary requirement for the production of the clearly audible, vocalic sounds at larger apertures (4 and above).

It may be pointed out that the musculature of the medium-dorsum is divided into three articulators, namely, the medium, the front dorsum, and the back dorsum, which are traditionally known as “front”, “central”, and “back” of the tongue respectively.

Section C2(b)(vii): Asymmetry of the Vocal Tract

Andre Martinet has written about the asymmetry of the vocal tract and its repercussions on the formation of speech sounds. This asymmetry is mainly caused by the angle of the jaws. With its vertex at the joint of the upper and lower jaws, the very angle is formed when the oral cavity is opened by the
movement of the lower jaw. Therefore, the medial ("front") articulator is characterized with more vertical space for maneuver than the back dorsal ("back") articulator.

This physiological asymmetry of the vocal tract naturally has an impact on the make-up and distribution of phonological units, both consonantal and vocalic. Given the disparity in the vertical space in the front and the back of the vocal tract, we expect that more phonological units may be formed by the front articulator than by the back articulator. This is particularly significant for the vocalic units of a language. For we find that quite a few languages have fewer vowels in the back than in the front.

Section C2(c): Acoustic Medium

Signals of a language are transmitted through a particular medium, the acoustic medium. Therefore, acoustic medium, as an orienting principle, becomes important in the analysis of speech sounds, both vocalic and consonantal.

The vocalic sounds can be acoustically analyzed and properly identified in terms of the frequencies of the first three formants \((F_1,F_2,F_3)\), as observed in the sound spectrograms. Likewise, the consonantal sounds are identified and classified with the help of acoustic cues which are obtained through spectrographic research.

It is noteworthy that the acoustic research has made a breakthrough in the study of speech sounds. For example, in
their study of the stop categories across languages, Leigh Lisker and Arthur S. Abramson (1964) have successfully demonstrated that at least three stop types (b d g, etc; p t k, etc; pʰ tʰ kʰ, etc.) can be clearly distinguished from one another by the single phenomenon of voice onset time. However, as they have themselves pointed out, the characteristics of the fourth stop category, the voiced aspriates (bʰ dʰ gʰ, etc.) cannot be accounted for by the voice onset continuum alone.

As for the voiced h and the voiced aspriates, these consonants can be properly analyzed in terms of both physiology and acoustics. For the "breathy voice" in these sounds is produced when the air from the lungs is forced through an unusual, narrow, triangular configuration of the glottis. (For further details, cf. Chapter I, Diagram I-1, comment 10, and Chapter V, Section D.)

Finally, it may be noted that some vocalic categories can also be properly analyzed in terms of physiologico-acoustic rationale. In the production of the "front" vowels, for example, a large resonance chamber is formed, extending form the glottis to the medium. And notwithstanding the angle of the jaws, there is sufficient vertical space for maneuver for the medium as an articulator in this triangular chamber. That is why this large chamber is more than adequate for the easy production and clear perception of the "front" vowels. On the
contrary, a much smaller chamber, from the glottis to the back
dorsum, is formed in the production of the "back" vowels. It is
to be noted that the width (the vertical space) of this
triangular chamber is greatly reduced because of the angle of
the jaws. As a result, the "back" vowels formed by the back
dorsum as an articulator, would require greater precision of
control in their production and an extra effort in their
perception. This problem is solved by the formation of
another resonance chamber from the back dorsum to the lips,
through the rounding of the labia. For the vocalic distinctions
made at the back dorsum are amplified through this front
chamber. That is why rounding of the "back" vowels and the
converse unroundedness of the "front" vowels is so naturally
widespread in the languages of the world.

Section C2(d): Human Behavior

Language is a particular instance of human behavior. For it is greatly influenced by the underlying characteristics of
human behavior: the human intelligence and the human
laziness. As a repercussion of intelligence and laziness, human beings seek a minimax solution between
accomplishment and effort, with minimum input and maximum output.

Human beings utilize their intelligence or problem
solving ability to infer the meaning of even complex
expressions, with the help of situation and context. Likewise,
they can jump to identify a word, such as pepper, on hearing only its first consonant or syllable, in a proper context of situation, such as eating in a restaurant.

The human laziness leads to the economy of effort, that is, a general avoidance of the use of a greater degree of precision than is necessary for the accomplishment of any given task.

Therefore, the power of inference and the economy of effort are the products of human intelligence and human laziness. And it is both inference and economy that together provide human justification for the particular make-up of a language, both phonological and grammatical.

Finally, it may be noted that quite a few phonological skewings in the number of units and their frequency of usage in the word, as encountered in languages, are explainable in terms of human behavior. For example, it is through the human trait pertaining to the economy of effort that we predict the preference of voiceless consonants (such as, p t k) produced by only the supraglottal articulators, over the voiced consonants (such as, b d g) produced by an additional, glottal articulator.

Section C2(e): Vision

It is well-known that vision plays a significant role in human communication. For watching people while they talk undoubtedly contributes to getting the message across; as you
hear the speech with your ears, you also read the face with your eyes. And of course, the eye becomes the main, indeed the only, organ of reception of speech for the deaf person who lip-reads. (Abercrombie, 1967:22.)

As noted earlier, vision is one of the five orienting principles of the Columbia school theory. But like physiology and acoustics, it too applies exclusively to phonology. Further, even in phonology, the impact of vision is limited to the make-up and distribution of the labial sounds, both consonantal and vocalic. For only these sounds are produced by the visible vocal organs--the labia.

Finally, it may be noted that the role of vision as an orienting principle, is most clearly discernible in the formation of morphemes and words in a language. Thus, in many languages, including Urdu, the frequency of the labial consonants is unusually high, in comparison with that of the apical, medial, or dorsal consonants, in the communicatively important initial position of the word. This skewed distribution of the labial and the non-labial consonants in word initial position, as we will explain later in Chapter IV, is mainly brought about by the interaction of vision and communication.

Section C3: Double Articulation of Language

The concept of "the double articulation of language" was developed by Andre Martinet. It highlights the minimization of
effort (the "economy") that can clearly be seen in full operation in human language, in both phonology and grammar.

The first articulation, as Martinet calls it, is that whereby every effect of experience to be communicated, every need that one wants to make known to another, is analyzed into a succession of units each of which is endowed with a vocal form (signal) and a meaning. These signal-meaning units, which emerge from the first articulation, are termed signes. What is even more significant from our viewpoint, is the fact that the signal part of each signe, or the signal-meaning pair, is further divisible into a series of distinctive sound units, i.e., the "phonemes". This is referred to as the second articulation of language.

It is noteworthy that a great deal of economy is achieved through the double articulation of language. The first articulation is economical in the sense that with a large but finite number of signal-meaning units (or signes), it is possible to express an infinite variety of messages through inference on the part of language users. These signal-meaning units, both grammatical and lexical, are not unique; they recur in different combinations in everyday discourse to convey various aspects of human experience. But if we were to set up an artificial system of communication, it would require a separate signal-meaning unit for each and every individual experience. Such a system would therefore have to have an
infinite number of units to cover all human experience, a number too great for even a computer to remember.

As compared to the economy by the first articulation, a greater degree of economy is achieved by the second articulation of language. For only a few dozens of distinctive phonological units (or "phonemes") are employed in different combinations to form the entire inventory of the signals for the signal-meaning pairs (or the signes) of a language.

Following Martinet's concept of the double articulation of language, the Columbia school linguistic theory is divided into two parts: phonological and grammatical. Inasmuch as the research presented in this thesis deals with phonology, it is only the phonological theory that is outlined in the Introduction here.

Section C4: Phonemic Inventory versus Phonological Grid

The "phonemic inventory" of the American structuralist school looks similar in some respects to the phonological grid of the Columbia school. It may however be noted that the inventory of phonemes and the phonological grid are to be differentiated from each other, for they are based on different parameters.

In American "descriptive phonemics", it appears that the phonemic inventory is a mere collection or listing of the phonemes of a language. To be sure, the list of the phonemes is presented with reference to the points of articulation and
the manner of articulation for consonants, and in terms of the parts of the tongue raised and the height of the tongue raised for the vowels. However, the above reference labels are apparently used for the convenience of identifying the individual phonemes of a language. Furthermore, it appears that the phonemic inventory does not emphasize the interrelationships of the phonemes.

In contradistinction to the phonemic inventory, the phonological grid of a language is organized in terms of articulators and apertures as devices of sound production, based on physiology and acoustics. As pointed out in section C2(b) above, all phonological units of a language, both consonants and vowels, are placed on the intersections of the relevant articulators and apertures. Further, the phonological grid is basically a network of phonological units representing their interrelationships.

We may also note that whereas the concepts of "pattern congruity" (i.e. symmetry) and "economy" (i.e. setting fewer phonemes) are utilized by American phonemicists in the construction of the phonemic inventory, our principles emphasize an asymmetrical pattern and a different kind of economy (i.e., that of articulation) for the phonological grid.

In both Columbia school phonology and American descriptive phonemics, the basic phonological units (or the "phonemes") of a language are established by contrast
through minimal and subminimal pairs. However, as this procedure involves the recognition of meaning in phonemic analysis, the descriptive phonemicists use it only as a shortcut for discovering the phonemes. For they insist that the phonemes must formally be established through distributional -substitutional criteria.

In the Columbia school phonology, on the other hand, it is perfectly all right to make full use of meaning for the identification of phonological units. For the phonological unit (or the "phoneme") is recognized as an elemental unit of communication, and communication is an important orienting principle for phonological analysis.

There are some other distinguishing characteristics of the phonological grid that set it apart from the phonemic inventory; they will be taken up, when we comment on the phonological grid of Deccani Urdu in Chapter I.

Section C5: Substance and Value in Phonological Analysis

The last quarter of the nineteenth century was an era of diametrically opposed views with regard to "substance" and "value" in linguistic analysis. The Neo-grammarians generally neglected value and emphasized the importance of substance in their monumental works on the Indo-European and historical linguistics. As a reaction to this, Ferdinand de Saussure highlighted the importance of value at the expense
of substance, particularly in his lectures, published posthumously as *Cours de linguistique générale* in 1916.

It was Andre Martinet who first talked of weighing substance and value on equal scales. Following this noted French scholar, Columbia school theory gives equal weight to both substance and value in linguistic analysis.

As we have noted in section C4 above, the phonological units are not isolated, individual entities that are grouped together for ease of reference. Rather, the phonological units are interrelated to one another in the network of the grid. In the saussurean framework, the *value* may be defined as the interrelationship of linguistic units. In phonology, therefore, the interrelationship of phonological units in the grid may be called the value of these units. However, for the Columbia school phonologists the phonetic *substance* of the phonological units, determined by the physiologico-acoustic factors, is equally important for the success of phonological analysis.

**Section C6: Syntagmatic versus Paradigmatic Relations in Phonology**

An ingenious scholar and original thinker, Ferdinand de Saussure is credited for introducing many concepts of lasting relevance in linguistics, and is rightfully known as the "father of modern linguistics". Thus it was Saussure, who introduced the dichotomy of *syntagmatic versus associative* relations for
linguistic analysis, with particular reference to grammar and lexicon. Afterwards, the Prague school phonologists, especially N. S. Trubetzkoy, applied this dichotomy to phonological analysis. However, in place of associative relationship, Trubetzkoy introduced the term paradigmatic relationship that appropriately refers to the phonological paradigm.

Following Trubetzkoy, combinatory characteristics in the linear organization of phonological units (or phonemes) are studied under the syntagmatic relations, whereas the interrelationships of these units in the phonological paradigm are dealt with under the paradigmatic relations. And as we have characterized the phonological grid in sections C4 and C5 above, it (the grid) constitutes the phonological paradigm of a language.

The syntagmatic versus paradigmatic dichotomy is very important for the phonological analysis in terms of the Columbia school theory. Thus, we will fully deal with both the paradigmatic make-up of the phonological units in the grid, and the syntagmatic organization of these units in the formation of words, as we present the phonology of Deccani Urdu in this thesis.

Section C7: Validation of the Analysis

The postulated phonological units which make up the grid and form the morphemes and words of a language are the
result of the analysis carried out on the basis of the observed
data on the one hand, and in terms of the motivating
principles (communication, physiology etc.) on the other. The
procedure of validating the hypothesized phonological units,
both in the paradigm and in the syntagmatic organization of
the word, is, in principle, the reverse of the analytical
procedure. That is, we prove that what we have hypothesized,
is fully justified in terms of the quintuple orienting principles
of phonology, and that it provides a close fit with the observed
phenomena. In practice, both procedures (analysis and
validation) go hand in hand, though it is only the validated
analysis that is presented as the finished product.

In validating a phonological analysis, we particularly
look for skewings. For they are readily observable, both in the
formation of units in the phonological paradigm and in their
frequencies of occurrence in the word. As a matter of fact, the
frequency counts provide reinforcement, through statistical
support, to the validity of the phonological analysis. For the
point of validation is a demonstration that the skewings are
produced by the interaction of the orienting principles
themselves.

Section D: Scope of the Study

In this thesis, we present an explanatory phonology of
Deccani Urdu as spoken in the City of Hyderabad. As outlined
in the previous section, the explanation of the phonological
analysis is carried out in terms of communication, physiology of the vocal tract, acoustic medium, human behavior, and vision—the independently known and verifiable orienting (phonological) principles of the Columbia school of linguistics. In fact, one chapter each is devoted to the quintuple orientations with a view to explaining the particular, "substantive" characteristics of the phonological units, the make-up of these units in the phonological paradigm, and the manner in which they combine in building up the inventory of lexical morphemes in Deccani Urdu.

A significant portion of research presented in the thesis is devoted to providing a motivated rationale, in terms of the orienting principles, for the paradigmatic asymmetries and the syntagmatic skewings encountered in the phonology of Deccani Urdu. This is mainly accomplished by presenting frequency counts for statistical support in the thesis.

However, it may be noted that the phonological analysis of Deccani Urdu, as presented in the thesis, is limited in three ways:

(1) Whereas both monosyllabic and longer words have extensively been utilized for illustrative examples throughout the thesis, and for contrast in word initial, medial, and final positions in the chapter on the communicative orientation of the language, the frequency counts used for the quantitative support of the analysis, are based on an exhaustive
(complete) collection of only the monosyllabic words of Deccani Urdu. A select but exhaustive collection of disyllabic and longer words, dealing with a particular facet of life in the speech community, will be added when the present research is prepared for publication.

(2) Only some select aspects of the five orienting principles that have a profound impact on the Deccani Urdu phonology, have been treated in the present research. Some other important phonological aspects of Deccani Urdu may be added to the present work, when it is prepared for publication.

(3) In the case of acoustic medium, it must be pointed out that any experimental, acoustic work is beyond the scope of the present research. Our analysis here is therefore based on the updated but secondary sources rather than on original research. There is no reason, however, that original acoustic research could not be undertaken at some future time for additional reinforcement of the phonological analysis presented in this thesis.