Chapter VI

INTERACTION OF THE ORIENTING PRINCIPLES IN THE PHONOLOGY OF DELHI URDU: SUMMARY AND CONCLUSIONS

A phonological analysis of Delhi Urdu has been presented in this thesis with the intent of showing that it is possible to explain the interrelationship in the paradigm of phonological units set up for Delhi Urdu, and the non-random arrangement of these units in the syntagm. Although a vast amount of data was collected during the field work in Delhi Urdu, the analysis is limited to the monosyllabic words in the dialect. The analysis is carried out and presented in terms of the five orientations as the principles of classification; namely, physiological mechanism, human behavior, communication, acoustic medium and the vision.

The phonological analysis as motivated by the five orienting principles, was taken up in five chapters, with a brief introduction. The summary and the result of the analysis are presented here in three sections. In section A we take up the interaction of physiology, human behavior, communication, and vision in Delhi Urdu phonology, with a view to highlight the fact that some of the phonological skewings in Delhi Urdu can be explained in terms of more than one orienting principles. Section B contains a brief summary of the phonological analysis of Delhi Urdu as presented in the various chapters of the thesis. The conclusions with regard to the research presented in the thesis are given in section C.
Section A: The Interaction

In the present work we have made an attempt to present the explanation of the non-random character and distribution of phonological units of Delhi Urdu in terms of the five orienting principles of Form-Content Linguistics. The explanation of the non-random character of Delhi Urdu phonological units in terms of these five orienting principles, was taken up in five chapters. But it has to be pointed that these orienting principles are not separate entities, but interact with each other. In fact, it is interaction of various orienting principles that produces various twists and turns in the phonology of a language.

There is an explicit or implicit relationship in the explanation provided under various heads in the thesis. It is beyond the scope of the present work to enumerate each and every instance of interaction encountered in the distribution of phonological units both syntagmatically and paradigmatically.

The interaction of the orienting principles can take any direction from the physiological mechanism to human behavior or between physiology and acoustics and so on. An attempt is made in the following pages to review some important instances whereby two or more orienting principles are found to be interacting is providing justification for the observed asymmetry in the phonological pattern of Delhi Urdu. As stated earlier our comments on acoustics are based on received knowledge, therefore, we have not specified the interaction of acoustic with other orienting principles.
1. In the rules of the physiological base given in section I-Al, we postulated that the articulator is the source of the production of phonological units. In the second chapter in section A3, preference for fewer articulators over more articulators was established. The preference for phonological units produced by fewer articulators was stated to be due to greater energy and coordination required to manipulate a greater number of articulators in simultaneity. It was the physiological feature (addition of articulators) that caused the disfavoring in terms of human behavior for phonological units produced by a greater number of articulators. It is due to the greater precision involved in the production of phonological units using more articulators, that voiceless stops and fricatives are preferred over voiced stops and fricatives, unaspirated consonants are preferred over aspirated consonants and oral vowels outnumber their nasalized counterparts. (For details see section A of chapter II). Since the articulator in terms of its mass and mobility is the determining feature involved in the production of phonological units, a fact clearly established in the physiological base, therefore all such instances whereby human preference or disfavoring for a certain unit or combination of units that is linked up to the manipulation of an articulator (or articulators) are evidence for the interaction of physiology and human behavior.

In chapter III section B2, we studied the occurrence of phonological units in various positions of the monosyllabic words in Delhi Urdu. It was seen that the disfavoring for complicated sounds is further increased in word final position where there is least communicative load. It was shown through tables voiced, aspirated consonants are more disfavored in word position than in initial position. Likewise there is greater pre-
ference for oral vowels in word final position than at the initial position (see section B2 of chapter III). Therefore, we see that physiology and human behavior interact to provide explanation of the distribution of phonological units, and that communication further justifies the disfavoring and favoring.

2. It was stated in chapter I section B1 that aspiration is physiologically more difficult than any other act of the glottis (i.e. voicing). Due to greater energy mobilization (use of the air supply) aspirated units do not occur twice in a syllabic (I-B1). In section II-A3, it was further stated the preference for unaspirated consonants over their aspirated counterparts is also reinforced in terms of human behavior, favoring fewer articulators over more articulators. In fact there was greater difference in frequency of voiceless and voiced stops than of aspirated and unaspirated stops. (Cf. Table II-3 and II-6). A particular skewing caused by complex manipulation of an articulator (physiology), can thus be explained in terms of human behavior and it is termed as the interaction of physiology and human behavior.

In chapter III section C3 (b) and C3 (c) it was noted that not only the occurrence of aspirated consonants is less as compared to their unaspirated counterparts, but in the final position of the words, aspiration of the consonants is dropped without any hindrance of the communicative process. It is an instance of interaction of physiology and human behavior with communication.
3. It is the articulator that determines the articulation. Therefore the difficulty or ease in the production of a unit or combination of units is measured in terms of tension or laxness of the articulator. We could see the repercussion of this physiological trait in providing justification for the preference of apico-dental units over the apico-palatal. (Cf. chapter II, section A₄ and A₅). Here too we have an interaction of physiology and human behavior.

4. In chapter I section C it was shown that in combination with 0-3 apertures, lingual articulators are preferred in the order of the hierarchy of adroitness: apical, medial and dorsal. De facto placement of labium on the scale of adroitness for the tongue was below the apex, above the medium, and close to the dorsum. It was later seen in chapter III, section C₃ (a) that the lesser communicative load of the phonological units at word final position furthers increases the preference for apical consonants over, dorsal and medial consonants in the position. It is indeed an interaction of the physiological mechanism with that of communication which lessens the need for marking all opposing distinctions in terms of articulators, in the final position of word, leaving the most adroit articulator, apex to dominate the position.

5. In chapter III section C it was shown that the initial position of a word carried greater communicative load than the final position. In the fifth chapter entitled 'Vision' we witnessed that labial articulator is used to the maximum in the production of consonants in words initial position, which carries most communicative load, and is reduced to the minimum in the word final position, which carries least communicative load. This is an instance of the interaction of communication and vision.
Section B: Summary

It has been stated in the "Introduction" that our phonological analysis is based on the speech of the old city of Delhi (in around Jama Masjid) and is limited to the exhaustively collected monosyllabic words of Delhi Urdu. But the bisyllabic words have been used in the illustrative examples for the validation of the analysis. We have also presented a brief theoretical background with regard to the five orienting principles of form-content linguistics.

In the first chapter, "role of physiological mechanism in the make-up and distribution of phonological units in Delhi Urdu" an attempt has been made to determine the role of the physiological mechanism in the make-up and distribution of phonological units of Delhi Urdu. First we established fifty seven phonological units of Delhi Urdu in terms of articulators and apertures. The source of energy for their production is a current of air flow coming from the lungs. Delhi Urdu phonological units were characterized in terms eight (8) articulators (labium, apex, medium, front dorsum, back dorsum, post dorsum, velum and glottis), and ten (10) apertures (0, 1, 1½, 2, 3, 4, 5, 6, 7 and 8). Degrees of apertures are subjected to two broad divisions. The first one divides the apertures into absolutely defined, smaller, constriction apertures (0-3), and relatives larger opening apertures without any constriction (4-8). The second division draws a line between resonants (3-8) and non-resonants (0-2).

The phonological units of constriction were further described in terms of degrees of constriction as stops, fricatives, nasals. Aperture 0 units were called stops, 1, 2, aperture units were labelled as 'fricatives'. Nasals were characterized in terms of two apertures (0+3), because nasals
are produced on an interaction of aperture 0 and 3. Aperture 3 units and the nasals fall in between aperture 0, 1, 2 and apertures 4-8, because they share constriction with the former and resonance with the latter.

We also dealt with the skewing in the combinatory patterns of phonological units in terms of the characteristics of the air current, and it was shown that combinations consisting of either of two phonological units with greater release of the air source or of two units involving strenuous release of the air sources are not favored, since they involve uneven distribution of the air source. Inasmuch as aspirated consonants involve greater air use, they do not recur in a single syllable in Delhi Urdu. Likewise, apertures, 0 and 1 involve abrupt and strenuous release respectively, therefore, their combination with one another requires greater air supply, therefore their uses was minimized in Delhi Urdu.

The hierarchy of adroitness of lingual articulators for consonants later in the chapter was also established in terms of their different mass and musculature. It is due to the triangular shape, being less massy and lying at the free side that the apex is the most adroit articulator. Owing to their rectangular shape and more flesh, medium and dorsum are less adroit. In fact, having the most complex musculature system, the medium of the tongue is the least adroit articulator among the apex, medium and dorsum. The root of the tongue was not included in this hierarchy because it is heavily tied to the base of the tongue and is the least adroit part of the tongue. De facto placement of the labium was also described. Given the musculature of the lower lip and the adroitness of the lower jaw, the labium was placed below the apex and above the medium and near to the dorsum in terms of the hierarchy of adroitness.
At the end of the chapter geared to the explanation of the non-random character of Delhi Urdu phonology in terms of the physiological mechanism, it was seen that due to their heavier mass only the medium and dorsum were used as articulator for the vowels, among the lingual articulators. Because unlike the consonants, in the production of vowels articulators do not excite the cavities but the only function of the articulator is to control the resonant cavities formed in the production of vowels. Due to the big size of the cavities, the heavier portion of the tongue (medium and dorsum) are physiologically fit for the control.

"Role of human behavior in the phonology of Delhi Urdu" the second chapter of the thesis is geared to the explanation of the role of human behavior in the distribution of the phonological units of Delhi Urdu on both the syntagmatic and paradigmatic levels. We took up the analysis of Delhi Urdu phonology in terms of human behavior in two parts. In the first part we dealt with the relative preference of gross articulatory movements over fine articulatory movements in the production of consonants, while in the second part we provided human justifications for the phonological grid which was earlier established in terms of physiological mechanism in the first chapter.

In the first part it was established that the production of consonants required fine articulatory movement, if the consonants were produced by (1) the use of more articulators vis-a-vis fewer articulator, and (2) the use of an articulator at remote point of articulation rather than at proximate point of articulation. As was to be expected, the production of consonants with fine articulatory movement was disfavored in Delhi Urdu.
It was shown with the help of the frequency count that large changes of aperture are preferred in Delhi Urdu. For as the difference in the aperture increased from one consonant to the other in the word, so did the number of words. Not only the larger change of aperture was preferred but aperture change in one direction was preferred to aperture change in more than one direction.

Disfavoring of multiple articulators was established by showing the favoring of phonological units produced by lesser number of articulators in the Urdu dialect under study. It is due to the multiplicity of articulators that the voiced consonants are less favored than the voiceless consonants, the aspirated consonants are disfavored vis-a-vis their unaspirated counterparts, and the nasalized vowels are less preferred than their oral counterparts.

Likewise the contact of apex at the palate (remote point) carries finer articulatory movement as compared to the contact of apex at teeth (proximate point). This difference in finer versus gross articulatory movement caused disfavoring of apico-palatal ("retroflex") consonants vis-a-vis apico-dental consonants in Delhi Urdu. Avoidence of making contact at two different points with the same articulator at the beginning and end of the CVC words was seen in the total skewing in favor of an apico-palatal ("retroflex") consonant after an initial apico-palatal ("retroflex") consonant.

Later in the chapter, we also justified the make-up of the phonological grid of Delhi Urdu in terms of the preference for easy over rough articulatory movements. It was seen that the phonological units that were less complex in terms of multiplicity of articulators, relative tension of the articulator and the combining of two or more apertures in their production, outnumbered those that involved fine articulatory movements in terms of either multiplicity
of articulators or relative tensions of the contact of the articulator at some remote point or using two apertures for a single unit.

"Role of communication in the phonology of Delhi Urdu" was taken up in chapter III. It was measured by examining the non-random character of the phonological units at both the syntagmatic and paradigmatic levels. At the paradigmatic level we gave the communicative justification for most of the phonological units in the phonological grid (Diagram I-1). The so-called positional variants are not established through communicative criteria; they are established on the basis of the physiological mechanism alone. The communicative based phonological units are established in terms of the phonemic contrast in minimal pair situations. Unlike the traditional phonemicists we use meaning in phonology without any apology, because meaning flows directly from communication, an orienting principle for phonological analysis.

At the syntagmatic level we dealt with four aspects of Delhi Urdu phonology. First it was shown that change in the order of the phonological units brings about change in meaning in CVC, CV and VC words. A second combinatory aspect of Delhi Urdu, explained in terms of communication, was the occurrence of phonological units in various positions of the word. We established through the frequency count that in terms of physiology and psychology there is general preference for voiceless consonants over the voiced consonants and for unaspirated consonants over their aspirated counterparts. Particularly to be noticed in the marked skewing in favor of voiceless unaspirated stops in comparison with the voiced aspirated stops. Likewise, oral vowels were shown to be favored over their nasalized counterparts. But as the figures clearly show, the tilt against, voiced,
aspirated consonants and nasalized vowels is greatly in word final position. The greater disfavoring for the complicated sounds at word position is caused by the lesser communicative load of the phonological units at the non-initial position of the word.

The third combinatory aspect of Delhi Urdu Phonology, explained in terms of communication is the occurrence of phonological units in the initial and final position of the word in terms of the hierarchy of adroitness of articulators. We have demonstrated through the frequency of usage that there is a much greater preference in word final position for the consonants produced by the physiologically most adroit articulator (apex), in comparison to the consonants produced by less adroit articulators (labial, dorsal, medial). The marked preference for the physiologically favored apical consonants in word final position is definitely motivated by lesser communicative need to utilize all phonological distinctions at the end of the word.

We also dealt with the effect on communication on the syntagmatic level of Delhi Urdu phonology by examining the contraction of some Classical Urdu bisyllabic words into monosyllabic words in Delhi Urdu. It had been shown that the syllabic reduction takes place by the drop of some medial or final phonological units. The non-initial location of the syllabic reduction can, therefore, only be explained in terms of the lesser communicative load of the phonological units in the medial and final positions of the word.

Later in the chapter we dealt with the merger of some Classical Urdu phonological units in Delhi Urdu. It had been shown that one consonant of Classical Urdu, namely, ( özelli) is the merginal phoneme in Delhi Urdu. For the lost of Classical Urdu fricative carries the least communicative load among
the consonant, hence is prone to elimination and merger. Further, except for the Classical Urdu h in non-initial position all other consonants of Classical Urdu survived intact in Delhi Urdu.

In contradistinction to consonantal merger, eight vowels of Classical Urdu are eliminated in Delhi Urdu and have merged with phonologically relevant vowels. The eliminated Classical Urdu vowels includes four short vowels and four long vowels. The eliminated long vowels include \( \varepsilon: \varepsilon: \circ:\circ: \). The eliminated long vowels have the lowest frequency among all the long vowels of Classical Urdu. Therefore, the physiologically motivated elimination of these open vowels and their merger with the neighboring long vowels \( \varepsilon: \varepsilon: \circ:\circ: \) respectively can best be justified in terms of communication. Further, the loss of the open vowels and their merger with neighboring long vowels creates some homonyms, but most members of these homonymous pairs differ in their form classes.

The Classical Urdu short vowels that have been eliminated in Delhi Urdu include \( \varepsilon: \varepsilon: \circ:\circ: \). Besides having the lowest frequency among all the vowels, these four short vowels of Classical Urdu are also limited in their occurrence to pre-h position. The elimination of these short vowels is thus precipitated by the loss of the following h and the compensatory lengthening of these short vowels to long vowels \( \varepsilon: \varepsilon: \circ:\circ: \) respectively. The elimination of Classical Urdu short vowels \( \varepsilon: \varepsilon: \circ:\circ: \) and their merger with their long counterparts \( \varepsilon: \varepsilon: \circ:\circ: \) creates some homonymous pairs.

At the end of the chapter we also dealt with homonymy, with particular reference to the loss of quite a few phonological units of Classical Urdu and their merger with the neighboring units in Delhi Urdu. It was shown that despite the large percentage of homonymy, the communicative process is not hindered in Delhi Urdu, for most of the homonymous pairs
differ in form classical and furthermore the remaining homonymous pairs can be set apart from each other in the context. Even further, communication in Delhi Urdu is also facilitated by the fact that in case of some commonly used words, potential homonymy is avoided by some apparently adhoc phonological changes from Classical Urdu to Delhi Urdu. Since the apparently sporadic phonological changes have been devised to keep the words of some potential homonymous pairs, these changes are fully justified in terms of communication.

The forth and the second last chapter of the thesis highlights the value of acoustic in the phonological analysis. Our comments on Delhi Urdu phonology in terms of acoustic are based on received knowledge. We have presented the acoustic rationale for lip rounding of the back dorsal vowels in terms of the formant frequencies.

In the fifth chapter, we dealt with the impact of vision in Delhi Urdu phonology. It was demonstrated through the frequency counts that in view of its visibility, the labial articulator is more preferred at the initial position of the word (where a word requires most communicative distinction), than at the non-initial position of the word. In most cases of the monosyllabic words, labial consonants fell to the minimum in the final position of the word, while at the beginning they competed well with the consonants produced by the most adroit articulator, the apex of the tongue.
Section C: Conclusions

The present analysis of Delhi Urdu is based on the assumption that phonological units of a language are tied to one another in a non-random relationship both paradigmatically and syntagmatically. These units are organized in terms of their physiological, human behavior, acoustic and communicative bases in the paradigm and are characterized by a value relationship. The arrangement of phonological units in the syntagm is also determined by their physiological, human behavior communicative or acoustic traits. In other words, phonological characteristics of a language are fully motivated by the orientations. The evidence that we have presented in validating phonological analysis of Delhi Urdu, proves this point beyond reasonable doubt. Therefore, the thesis may not only contribute to our understanding of the inner mechanism of Delhi Urdu phonology, but also to our understanding of the theory of phonology in general.

The thesis contains both theoretical and methodological innovations in the study of Delhi Urdu phonology. It abandons description in favor of explanation in terms of independently verifiable orientations, and presents quantitative procedures for validating the phonological analysis.