CHAPTER VI

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A phonological analysis of Lucknow Urdu has been carried out with a view to showing the role of five orientations, namely, physiological mechanism, human behaviour, communication, acoustic medium, and vision as the motivating principles for departures from the non-random distribution of the phonological units, both syntagmatically and paradigmatically. This chapter is divided into three sections. Section A comprises a chapterwise summary of the analysis presented in the thesis. Section B deals with the selected phonological skewings that are produced by the interaction of two or more orienting principles. Section C contains our conclusions with a remark on the worth of our analysis.

Section A: Chapterwise Summary:

The introductory chapter consists of description on the historical setting of Lucknow Urdu, the procedures adopted during the fieldwork for the purpose of collecting the data, a discussion on the theoretical base used for analysis and the scope of the study. The theoretical background of the approach undertaken here has been dealt with against the backdrop of Form-Content theory with particular reference to the five orienting principles for phonological analysis.
In the first chapter entitled "The role of physiology in the phonology of Lucknow Urdu", an attempt has been to determine the role of physiological mechanism in the makeup and distribution of the phonological units of Lucknow Urdu. This chapter is divided into three major Sections, A, B, and C. In Section-A, the phonological grid of Lucknow Urdu is presented which is followed by explanatory comments on the various aspects of the paradigm. In Section-B, the paradigmatic makeup and the distribution of the consonantal units in the syntagmatic organization in the word have been analyzed in terms of the hierarchy of the adroitness of articulators. The impact of the amount of energy utilized in combinatory phonology has been analytically looked into in Section-C.

In Section-A, the communicatively based 61 phonological units of Lucknow Urdu have been presented diagramatically in the phonological grid in terms of 8 articulators and 9 degrees of apertures (0 through 8). The phonological units are broadly divided into two types, namely, constrictions and openings. The constriction apertures are 0 aperture (stops), 1, 1 1/2, and 2 apertures (fricatives), and 3 aperture (liquids). The openings on the other hand, extend from 4 to 8 apertures (vowels: monophthongs/ diphthongs). It has also been pointed out that
the phonological grid is different from the "phonemic inventory" which is traditionally based on the substitution distribution criteria used by the American structuralists.

In Section-B it has been shown that the relative adroitness of the lingual articulators affect both the paradigmatic makeup and the syntagmatic usage of the phonological units. The hierarchy of the adroitness of articulators follow the following order of preference: the light, tapering, less massy apex makes the apical units most favoured, followed by the labials-dorsals as the more favoured, medials as the less favoured, and the post dorsals as the least favoured phonological units. Although the statistical figures do largely validate our claim, there are some skewings that go against the preference in terms of the hierarchy of adroitness of articulators. Adequate rationales have been provided for justifying these contrary expectations.

With regard to the impact of the amount of energy utilized, (Section-C), it has been shown statistically that phonological units that utilize a strenuous and greater amount of energy of air source are disfavoured in the combinatory phonology of Lucknow Urdu. Similarly words with consonant clusters (CVCC and CCVC) and aspirated consonants are disfavoured because in both, the production of consonant
clusters and aspirated consonants greater amount of energy is consumed.

In the second chapter entitled, "Human Behaviour: Its role in the phonology of Lucknow Urdu", we have assessed the impact of human behaviour on both the paradigmatic makeup and the syntagmatic distribution of the phonological units in Lucknow Urdu.

This Chapter broadly covers two aspects of human behaviour, namely, the relative preference of gross articulatory movements (fewer versus more, etc.) over fine articulatory movements, and the human behaviour justification for the phonological grid. We have divided this chapter into five major sections.

In Section-A, we highlighted the preference for fewer articulators over more articulators in terms of voiceless-voiced, unaspirated-aspirated and oral-nasal phonological units. It is seen that phonological units which employ fewer articulators like the voiceless, unaspirated, and non-nasal (vowels) units are preferred over the voiced, aspirated, and nasal (vowels) units because the latter utilize more articulators in their production and therefore, require greater precision of control.

In Section-B, we have shown that the apico-dental ("dental") consonants with proximate point of articulation...
are preferred over the apico-palatal ("retroflex") consonants with remote points of articulation. As compared to the paradigmatic makeup of the phonological units, the preference for the apico-dental consonants *vis-a-vis* the apico-palatal consonants is conspicuously more in the syntagmatic organization of the word.

In Section-C, we have discussed the assimilative traits of neighbouring phonological units. It was seen that in successive segments, neighbouring phonological units tend not to be precisely differentiated from each other to avoid fine precisely coordinated movements and therefore assimilated to become similar. The phonological units became similar on account of ad-hoc phonological changes as well.

Section-D dealt with the impact of the aperture change on the combination of the phonological units. In this section, an attempt was made to validate the claim that in successive segments, large changes of apertures are preferred over small changes of apertures and combinations of unidirectional aperture changes are favoured over combinations with multidirectional aperture changes.

Justification of the phonological grid of Lucknow Urdu in terms of human behaviour formed the basis of Section-E. In this Section, we made an attempt to provide reinforcement to the validity of the phonological units in Lucknow Urdu.
which are established on physiological factors in terms of the physiological mechanism.

As the title, "Communication: Its role in the phonology of Lucknow Urdu" suggests, Chapter-III evaluates the role of communication in the non-random distribution of the phonological units at both the paradigmatic and the syntagmatic levels. The impact of communication on the paradigm of the phonological units, the syntagmatic distribution of the phonological units, the phonological merger and homonymy have been discussed here under the Sections A, B, C and D, respectively.

In Section-A, we have provided the communicative justification for the presence of 56 phonological units as against 61 in the phonological grid. The 56 "phonemes" or distinctive units of Lucknow Urdu have been established in terms of phonemic contrast in minimal and sub-minimal pairs.

In Section-B, we have dealt with such pairs of words in which the phonological units have been reversed to highlight the role of communication in the syntagmatic usage in the word. We have also discussed the syntagmatic usage of monosyllabic words in their entirety and the effect of communicative load on the position of the phonological units in the word in terms of the hierarchy of the adroitness and
the number of articulators. It has been shown that a change in the order of the phonological units bring about a change in meaning in the CVC, CV and VC words.

Through the frequency of usage it has been established that the already disfavoured voiced and aspirated units in terms of physiological mechanism and human behaviour are further disfavoured word finally than word initially in terms of communication. With regard to the hierarchy of adroitness of articulators, it has been shown through statistical data in terms of frequency count that the already favoured apical and the less favoured non-apical units compete well in the initial position of the word due to higher communicative load in that position as opposed to the communicatively disfavoured final position where the already favoured apical consonants and less favoured non-apical consonants are further favoured and disfavoured, respectively.

In Section-C, we have dealt with the effect of communication on the phonological merger of certain consonantal units. Total or partial merger of these units takes place as a result of their low communicative load.

In Section D, which deals with homonymy, we have given examples to show the homonymy being created in the language as a result of final deaspiration or drop of h in the final
position of the word. We have seen that such type of homonymy is easily tolerated by Lucknow Urdu.

The fourth chapter entitled, "Acoustic base of the phonology of Lucknow Urdu", deals with the role of acoustics in the phonology of Lucknow Urdu. Although acoustic medium is one of the orienting principles of this theory, its use in the justification of the phonological grid is merely based on received knowledge. We have simply made an attempt to provide lip-rounding of the back dorsal vowels in terms of formant frequencies.

The fifth and the last chapter entitled, "Role of vision in the phonology of Lucknow Urdu", highlights the role of vision as an orienting principle for the phonological analysis. We have shown that vision has no direct bearing on the phonological paradigm. However, its impact is visible on the syntagmatic organization of the word. It has been shown through frequency of usage that in view of its visibility, the labial articulator is more preferred at the beginning of the word than at the non-initial position. Although, labial consonants are next in the line after the apical consonants in terms of hierarchy in the word initial position, they show a downfall at the end of the word in terms of vision. The impact of vision is, however, limited to the labial consonants of Lucknow Urdu.
The thesis ends with "Summary and Conclusions".

Section B: Interaction of Orientations in the Phonological Skewings

In the present work we have made an attempt to present the explanation of the non-random distribution of phonological units in Lucknow Urdu in terms of five orienting principles of Form-content linguistics. The phonological skewings encountered in Lucknow Urdu have been taken up in individual chapters in terms of these principles. Inasmuch as these orienting principles are interactive in nature, the need is to highlight as to how interaction of different orientations creates phonological skewings in Lucknow Urdu.

As mentioned earlier, it may be pointed out that out of the five orienting principles, acoustic medium has not been taken into consideration here because it is based on received knowledge. In Lucknow Urdu we come across many phonological skewings which are favoured or disfavoured by more than one orientations. Only the selected phonological skewings are discussed here in three subsections, by taking two or more orienting principles.

Section B1: Non-aspiration versus aspiration

The rationale for the preference of unaspirated consonantal units over their aspirated counterparts comes
from physiology, (Chapter I, Section C), human behaviour (Chapter II, Section A), and communication (Chapter III, Section B3).

In terms of physiology, the unaspirated consonantal units (p, t, ʈ, ɾ etc.) are preferred over their aspirated counterparts (ph, th, ṭh, rh, etc.). This is because unlike the former units, the latter units involve the highly energy consuming combination of aspiration or h with the units of apertures 0 and 3. Furthermore, the production of aspirated units requires supply of air from the lungs that must be pushed through the larynx and gushed through the oral cavity to produce puff of air at the release of the oral closure. This additional physiological factor becomes responsible for the disfavouring of the aspirates.

The human behaviour also justifies the additional favouring of unaspirated consonantal units over their aspirated counterparts. While both the aspirated and unaspirated units are produced by the same supraglottal articulators, the production of the aspirated units requires the use of an extra articulator i.e. the larynx. As the simultaneous use of more than one articulators requires a fine, precise coordination of these articulators, the phonological units so produced are disfavoured due to the human preference for minimum effort.
The preference for the unaspirated units is further increased in word final position for communicative as well as physiological reasons. As mentioned earlier, the aspirated units are produced by exhaling the air to be supplied by the lungs. In the initial position of the word we have more air available in the lungs than in the final position. Therefore, the disfavouring of aspiration in the final position is reinforced by the communicative factor.

Section B2: Voicelessness versus Voicing

The rationale for the preference of voiceless units over their voiced counterparts comes from both human behaviour (cf. Chapter II, Section A) and communication (cf. Chapter III, Section B3). Unlike their voiced counterparts (b d ɬ; bh dh ɬh etc.), the voiceless units (p t ŋ; ph th ŋh etc.) do not involve any extra articulator in their production i.e. the larynx. In the absence of this extra articulator, the voiceless units are easier to produce as they require less precision of control and are, therefore, favoured in terms of human behaviour.

In the communicatively favoured initial position of the word, there will be a fuller utilization of opposing phonological units - voiced versus voiceless, aspirated versus unaspirated. Despite the fact that the voiceless and
the voiced consonants compete well in the initial position in Lucknow Urdu, the voiceless units are still slightly preferred over their voiced counterparts. In the communicatively less important word final position, however, there is a drastic skewing in favour of the voiceless consonants. This is in full conformity with our expectations. For the least complex units in terms of physiology, acoustic, and human behaviour should be productively utilized in word final position with minimum communicative load.

Section B3: Skewings in the Makeup and Distribution of Apical, Labial, Dorsal, Medial and Post Dorsal Consonants

The skewings in the makeup and distribution of apical, labial, dorsal, medial and post dorsal consonants bring the three orienting principles, namely, physiology, communication and vision together in terms of interaction.

In terms of hierarchy of adroitness of the various supraglottal articulators, the apex stands at the top being the most adroit articulator owing to its extra flexibility. Then comes labium, dorsum, medium and finally post dorsum. We expect an effect of this relative adroitness of the various supraglottal articulators on the makeup as well as on the frequency of usage of consonantal units in Lucknow.
Urdu. Thus, we have 17 apical consonants (9 apico-dental and 8 apico-palatal), 8 labial consonants (including w), 8 dorsal consonants (including w), and 7 medial consonants and only 1 post-dorsal consonants. This paradigmatic distribution conforms to our expectation in terms of the hierarchy of adroitness of articulators.

The preference for the apical consonants produced by the most adroit apex, is vastly enlarged in the frequency of usage for the four types of consonants in their syntagmatic distribution. Of the 3356 occurrences of the five types of consonants, the apicals appear in 1641 (48.90%) instances, the labials occur in 683 (20.30%) instances, the dorsals occur in 553 (16.48%) instances, the medials appear in 452 (13.47%) instances, and the post-dorsal in 27 (0.80%). It is noteworthy that despite the additional tilt in favour of the apicals, the relative preferences in terms of the adroitness of hierarchy remain constant.

There is a different kind of tilt in the frequency of usage for the five types of consonants in the initial and the final position of the word in Lucknow Urdu. This tilt is caused by the interaction of communication and vision with physiological mechanism.

In the communicatively important word initial position, we expect fuller utilization of the contrasting phonological
units. That is, there should be a fair competition between the apical, the labial, the dorsal, the medial and the post-dorsal consonants in that position of the word. As a result of the interaction of communication with the adroitness of hierarchy, there is a significant levelling off in the usage between the five types of consonants. Thus, of the 1552 word initial occurrences of these consonants, the apicals appear in 634 (41.38%) instances, the labials in 433 (68.40%) instances, the dorsals in 241 (46.26%) instances, the medials in 234 (65.73%) instances, and the post-dorsals in 10 (50.00%) instances. Despite the levelling off dictated by communication, it is to be noted that the relative preferences in terms of the adroitness of hierarchy remain constant even here.

Here, there is one discrepancy in the usage of the five types of consonants that still needs to be accounted for. There is an unusual increase in the number of occurrences for the labial consonants in word initial position. Communication and vision together cause this skewing in favour of the labial in that position.

In contradistinction to word initial position, the final position carries the minimum communicative load in the word. Rather than the competitive use of the opposing phonological units, we expect selective use of phonological units, preferring the easy to pronounce and the least
complex consonants in word final position. That is, both communication and physiological mechanism join forces in tilting the balance in favour of the apicals (and other less complex consonants) in that position of the word. Thus, of the 1510 word final occurrences of the five types of consonants, the apicals appear in 898 (58.62%) instances, the labials in 200 (31.60%) instances, the dorsals in 280 (53.74%) instances, the medials in 122 (34.27%) instances and the post-dorsals in 10 (50.50%) instances.

Again the discrepancy in the usage of the labial consonants is noteworthy. For these consonants are significantly reduced in their frequency of occurrence in word final position. This is due to a compensatory decrease of the labials in the communicatively less important word final position to offset the substantial increase of the labials in the communicatively more important word initial position, as a result of interaction with vision.

Section C: Conclusions

The following points may be presented by way of conclusion:

1) Of the total number of 61 phonological units set up for Lucknow Urdu, 41 are consonantal units and 20 are vocalic units (monophthongs and diphthongs).
2) Of a total of 61 phonological units set up for Lucknow Urdu, there are 56 "phonemes" established through contrast in minimal and sub-minimal pairs and the remaining phonological units are phonetic variants or "allophones" that fall on the relevant intersections of the articulators and apertures based on physiological mechanism and are raised to the status of phonological units.

3) Phonological grid of Lucknow Urdu is basically different from its "phonemic inventory". As a result of this difference, the criteria of establishing "phonemes" are also different. Thus the "phonemes" listed in the "inventory" are although formally established through substitution-distribution criteria, in actuality they are established through contrast in minimal and sub-minimal pairs. On the other hand, the criteria of meaning become the basis for establishing the phonological units in the grid. Communication, which is one of the orienting principles used in this study, provides a justification for the use of meaning in phonological analysis.

4) The phonological units in the grid do not have a vacuous existence. Unlike the "phonemes" which are merely listed in the "phonemic inventory", the phonological units presented in the grid highlights the
value relationship of the phonological units. Further, the articulatory (and acoustic) characteristics form the basis for determining the phonetic substance of the phonological units. Thus, in the present phonological analysis, both phonetic substance and phonological value are weighed on an equal scale.

5) Since the motivation for the non-random distribution of phonological units in a language comes from all the five orienting principles of Form-Content linguistics, the interactive nature of these principles help further justify the phonological skewings encountered in Lucknow Urdu. For example, the preference for the unaspirated consonantal units over their aspirated counterparts, or the voiceless units over their voiced counterparts etc. get justification and support not just from one principle, but from two or more principles in terms of interaction.

6) A number of studies have been carried out for the analysis of Modern Standard Urdu and some of its important dialects from the descriptive linguistics framework. Even phonetic and phonological descriptions have also been written for Modern Standard Urdu and its regional variants like Deccani Urdu, Delhi Urdu, etc. However, these studies suffer from certain limitations. Based on selective data, these works simply present the
phonemic analysis in the framework of traditional linguistics. Against the background of these shortcomings, the present study is an improvement over the traditional analyses. In the phonological analysis presented here, we provide the explanation of the non-random distribution of the phonological units in both their paradigmatic interrelationships in the grid and their combinatorial characteristics in the syntagm, in terms of the five orienting principles.

7) The qualitative support through frequency counts based on the exhaustively collected data (comprising monosyllabic words) further validates the phonological analysis presented here. It also helps vindicate the modest submission that the present phonological analysis is innovative and departs radically from the traditional analysis.

The evidence that we have presented for establishment of the phonological grid for Lucknow Urdu, 61 units, and for their non-random occurrences in the various positions of the monosyllabic words, in terms of the phonological principles of Columbia School of Linguistics, seems to prove the validity of our analysis beyond reasonable doubt. Besides, explaining the inner mechanisms of the phonology of Lucknow Urdu this thesis has also contributed towards our understanding of the phonological
theory that presents new procedures for the validity of phonological units and their non-random distributional patterns.