The thesis presents a phonological analysis of Lucknow Urdu based on the phonological principles of Columbia School of Form-Content Linguistics. The theoretical basis of the theory of Form-Content Linguistics is a chain of scholarly descent from Ferdinand de Saussure and Andre Martinet. It started from Prague School and reached the Columbia School of Linguistics under the steward leadership of Professor William Diver who reared and nurtured this theory at Columbia University through further research.

Following this approach, a phonological analysis 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.

The verbal repertoire of the artisans, craftsmen, and other skilled workers of Lucknow forms the data for the analysis.
The present phonological analysis of Lucknow Urdu is limited in scope, both in the utilization of the data and the application of the five orienting principles. Although, a vast amount of data was collected during the fieldwork in Lucknow, the analysis is mostly limited to the monosyllabic words. Some bisyllabic and polysyllabic words are also used, at times, as illustrative examples for the reinforcement of the analysis. With regard to the orienting principles, we have basically concentrated on principles, namely, physiological mechanism, human behaviour, communication and vision. The fifth orientation, namely, acoustic medium is beyond the scope of the present study. However, on the basis of received knowledge on acoustics, we have used this orientation to reinforce our phonological analysis.

The thesis is divided into five main chapters, in addition to the Introduction and Summary and Conclusions. The five chapters basically cover the five orienting principles and look into their role in the phonology of Lucknow. Interaction of orientations in the phonological skewings has been discussed in Summary and Conclusions of the thesis. The major portion of the data along with Notes on Glossary of Monosyllabic Words have been enlisted under Appendix-A. Additional list of data comprising monosyllabic, bisyllabic, and polysyllabic words has been provided under Appendix-B, C and D, consisting of kinship terms, names of the months and
festivals of muslim women, and names of the months of the Hindu calendar, respectively.

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 the analysis, and the scope of the study. The theoretical background of the approach undertaken here has been dealt with against the background of Form-Content theory with particular reference to the five orienting principles for phonological analysis.

The first chapter deals with the role of physiology in the phonology of Lucknow Urdu. In this chapter 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 four 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-D we have presented summary and conclusions.

In Section-A, the communicatively based 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. It is seen
that the units of aperture-1 require the greatest amount of
energy, followed by the units of apertures 1 1/2, 2, 0 and
3.

The role of human behaviour in the phonology of
Lucknow Urdu has been taken up in Chapter-II. In this
chapter 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 behavior, namely, the relative preference of gross articulatory movements (fewer versus more, etc.) over fine articulatory movements, and the human behavior justification for the phonological grid. We have divided this chapter into five major sections including summary and conclusions.

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 point 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.

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. Section E is the summary and conclusions.

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. The five positional variants (n, n, 1, r, rh) were not established communicatively, since they have been established on the basis of physiological mechanism alone.

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 least favoured non-apical units (labial, dorsal, medial and post dorsal) 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 are additionally favoured; and the less favoured non-apical consonants are further disfavoured.

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.

Homonymy, which is a communicative problem, has been dealt in Section-D. It means a process whereby a word becomes the same in form as another, with a clear distinction in meaning. Although, the percentage of homonymy is large, the communicative process of Lucknow Urdu is not
affected. This is because, the homonymous pairs can be distinguished from one another in the context. Homonymy has particularly been highlighted with regard to two aspects. The first aspect deals with homonymy which is the result of word final deaspiration or loss of h. The second aspect discusses the word final deaspiration with aspirated stops or h in word initial position.

Chapter-IV 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 lack of symmetry in the vocal tract is seen to be the reason for the rounding of the back vowels. There is less space for back (back dorsal) vowels than for the front (medial) vowels. For the back vowels the chamber is from the dorsum to the larynx and for the front vowels the chamber is from the medium to the larynx. The chamber is bigger for the front vowels as compared to the back vowels, so less distinctions of vowels are possible at the back. In order to make the back vowels acoustically distinct from each other and that from front vowels, it is essential to increase the
size of the resonance chamber for the back vowels. The utilization of lip-rounding for the back vowels form two chamber (a) dorsum (back) to larynx; (b) dorsum (back) to lips, which increases the size of resonance chambers. Thus lip-rounding becomes an essential tool for the distinction of back vowels. It is in an acoustic light that we can justify the rounding of back vowels and converse unroundedness of the front vowels.

Chapter-V 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.

Thus, it is vision which demonstrates the importance of communication by favouring visibility in the
initial position of the word, just where most of the distinctiveness is at stake.

The summary and conclusions on the present phonological analysis are presented at the end of the thesis. The thesis also includes instances of interaction of the phonological principles with each other ranging from interaction between physiology and communication, human behaviour, vision and communication etc. However, we have not specified the interaction of acoustic medium with other orienting principles on the ground that it is based on received knowledge only. The interactions show a strong bond in the explanations provided through physiological mechanism and human behaviour and in many instances of physiological mechanism and communication which justify the favouring or disfavouring of certain factors. For example, the rationale for the preference of unaspirated consonantal units over their aspirated counterparts comes from physiology, human behaviour and communication. Similarly, the rationale for the preference of voiceless units over their voiced counterparts comes from both human behaviour and communication.

The thesis consisting of the phonological analysis of Lucknow Urdu contains both theoretical and methodological innovations in the study of Lucknow Urdu. It is based on the
assumption that the phonological units of a language are tied to one another in a non-random relationship both paradigmatically and syntagmatically. The phonological units in the paradigm are tied to one another in terms of value relations, which is organized in terms of physiologico-acoustic factors. The syntagmatic arrangement of the phonological units are also determined by the orienting principles. Thus, the phonological characteristics of a language are fully motivated by the orienting principles which is evident in the phonological analysis undertaken here and proves the validity of our analysis beyond doubt.

Thus, the thesis may not only contribute to our understanding of the inner mechanism of Lucknow Urdu phonology, but also to our understanding of the theory in general. It abandons description in favour of explanation in terms of distinctly identifiable orientations. It is also innovative in that the validation of the phonological analysis is conducted through quantitative procedures both in the paradigmatic makeup and syntagmatic organization of the word in Lucknow Urdu.