CHAPTER I
INTRODUCTION

"The whole universe is filled with sounds and communication is solely with the help of speech"¹

The word Vāk comes from the root of Vac, which means 'to speak'.² In the book "Aitareya Brāhmaṇa" Speech has been compared to the ocean on account of its inexhaustible nature.³

The vowels were compared to the day and the consonants to the night.⁴ The consonants were considered pearls in the string of vowels,⁵ perhaps due to the superior perceptibility of the vowels in normal speech.⁶

Indian grammarians had given so much importance to speech that they even considered speech the only ornament of human beings and they said that there is nothing beyond speech.⁷ They tried to define speech and to understand the phenomena of speech production and perception.

However, in recent years the views of the Westerners have gained importance and those of Sanskrit literature have been relegated to the background.

Recently using the knowledge from the Sanskrit literature great and surprising achievements have been made in many other fields like rhinoplasty. However, not much attention has yet been paid to the information in Sanskrit literature by the field of speech and hearing.
In this context of awareness of a lack of comprehensive information and of a renewed interest in Sanskrit literature, a review of Sanskrit literature with respect to the field of speech and hearing was undertaken (1979).

That study compiled the information with respect to
1) Diseases in general,
2) Speech Pathology and
3) Audiology.

Under speech pathology information regarding the following was compiled; viz:

1) Definitions of normal and defective speech,
2) Definitions of normal and defective voice,
3) Theory of speech production,
4) Theory of speech perception,
5) Phonetics,
6) Intonation and rhythm,
7) Speech disorders; their causes and treatment.

Phonetics included, the study of speech sounds, their pitch, duration, intensity, modulation and conjunction.

Paninīya Sikṣā classified Sanskrit speech sounds on the basis of their pitch (svara), duration (kāla), place of articulation (sthāna), effort (prayatna), and sound material (Anupradāna).

Three types of Pitch for vowels were described:—high pitch, low pitch, and high low pitch.
Quantity was considered as the time taken to utter a speech sound. It was observed that all the consonants took half a māṭrā in their production, all the short vowels one māṭrā, all the long vowels and fricatives two māṭrās and the prolated vowels three māṭrās, where māṭrā was considered as a unit of time. Speech sounds having the same quantity were grouped together.

Eight places of articulation were considered; Viz: chest, throat, head, alveolus, teeth, nose, lips, and soft palate.

Effort and sound material were combined under the term "primary Effort" (prayatna) by later authors. Primary effort subsumed effort termed internal effort (ābhyaṃta prayatna) and sound material termed external effort (bāhya prayatna).

Internal efforts were those taking place within the oral cavity during inspiration and before the production of speech sounds. They were concerned with the degree of opening between the articulator and the place of articulation and constriction area. In other words, internal efforts could be considered as the preliminary adjustment of the articulators in order to produce the different speech sounds.

After the generation of the internal efforts (after the different articulators are set properly in order to produce specific speech sounds), it was thought that an essence or base (neural?) of the speech sound was generated after which were generated the external efforts.
External efforts were those taking place during expiration and after the generation of the speech sound essence. External efforts were concerned with the following:

1) State of the vocal cords (open widely / vibrating);
2) source characteristics (Noise source / voice source);
3) volume of the air utilized in the speech sound production (less / more volume) and
4) the status of the speech musculature in pitch production.

Some of these compared well with the views of the westerners.

During that review interesting statements regarding primary effort and quantity were found. There are several studies regarding the duration and characteristics of speech sounds to verify the western literature. However, the western speech scientists have not paid much attention to Sanskrit literature. Hence it was felt that the concepts in Sanskrit literature could be experimentally verified.

The present study was undertaken, in this context to verify the concepts of quantity and primary effort of selected Sanskrit speech sounds.

It was carried out in two parts; 1. formation of Hypotheses and 2. verification.
Part I was carried out in three stages, viz: 

1) Information with respect to quantity and primary effort in Sanskrit literature were compiled.

2) Information with respect to duration and characteristics in Western literature were compiled.

3) The information of Sanskrit literature and Western literature were compared. Based on the comparison, spectrographic correlates of quantity and primary efforts were hypothesized.

In part II those hypotheses were verified. Thus the quantity and primary efforts of selected Sanskrit speech sounds were spectrographically examined.

The present study was limited to:

1) Sanskrit speakers with Kannada as their mother tongue. It is possible that the speech habits of Sanskrit speakers with mother tongues other than Kannada are different.

2) The speech samples of only ten subjects.

The review was limited to the books available in the cities of Mysore and Bangalore.

The study of Sanskrit vowels (with respect to their quantity and primary effort) was limited to the initial position and that of fricatives, semi-vowels and selected sansas was limited to the medial position.

Implications of the study:
Implications of the study:

It was assumed that the information revealed by this study would lead to a greater knowledge and greater appreciation of the work of Indians in the field of experimental phonetics.

It was also assumed that the study would help in the development of the field by

1) Providing additional information,
2) Quantifying vowels and consonants,
3) Suggesting more variables like quantity for therapy and
4) Providing a base to verify the concepts in other Indian languages.