

Pāṇiniya Śikṣā's Phonetic Apparatus and its Applications for Modern Languages

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Abstract- Sanskrit language is not only an epitome of Indian history, culture and heritage rather it is also a vital means for the study of applied linguistics in the modern age. A thorough linguistic analysis of the Sanskrit language reveals that it incorporates some of the important linguistic elements that can be universally applied to any natural language. One of the six Vedangas (supplemental branch of the Vedas), the śikṣā texts talk about the Vedic study of sound, focussing on the letters of the Sanskrit alphabet, accent, quantity, stress, melody and rules of euphonic combination of words during a Vedic recitation. In a linguistic context, śikṣā can be described as the science that teaches the proper pronunciation of words and laws of euphony. One of the significant śikṣā texts, Pāṇiniya Śikṣā is a prominent treatise on articulatory phonetics (uccāraṇaśāstra) that discusses the production mechanism of sounds, places and manner of articulation, classification of speech sounds, types of accents or intonation (udātta, anudātta and svarita), characteristics of a good speech or a bad speech, reasons for fluency or disfluency in speech, etc in detail. This paper explores the phonetic apparatus of Pāṇiniya Śikṣā, analyzing its detailed classification of sounds based on place and manner of articulation, as well as its insights into phonetic processes such as sandhi (euphonic combination) and svāra (accent or intonation). By comparing these principles with modern phonetic and phonological frameworks like Distinctive Features Theory (Jakobson, Chomsky & Halle, 1951, 1968), Autosegmental Phonology (Goldsmith, 1976), Prosodic Phonology (Selkirk, 1984), etc., we highlight how Pāṇiniya Śikṣā anticipates key concepts in articulatory and acoustic phonetics. Additionally, the paper investigates potential applications of its phonetic insights for modern language learning, speech synthesis, and linguistic pedagogy. The structured phonetic system outlined in Pāṇiniya Śikṣā not only enhances our understanding of Sanskrit phonology but also offers valuable tools for phonetic analysis and pronunciation training in contemporary languages. Through this study, we demonstrate the enduring relevance of ancient Indian phonetic thought in modern linguistic research and technology.

Keywords- Pāṇiniya Śikṣā, Phonetics, Distinctive Features Theory, Autosegmental Phonology, Prosodic Phonology.

References

1. Allen, W. Sidney. "Phonetics in ancient India." *Oxford University Press* (1953).
2. Chomsky, Noam; Halle, Morris. "The sound pattern of English." *Haper and Row* (1968).
3. Deshpande, Madhav M. "Ancient Indian Phonetics." *Concise History of the Language Sciences*. 1995. 72-77.
4. Gautam, Kapil. "Phonetics and Phonological Rules in Pāṇiniya Śikṣā." *Shri Vaishnavi*. 2018. 186-194.
5. Ghosh, Manomohan. "Pāṇiniya Śikṣā or the Śikṣā Vedanga ascribed to Pāṇini: being the most ancient work on Indo-Aryan phonetics." *University of Calcutta* (1938).
6. Goldsmith, John. "Autosegmental and metrical phonology." *Basil and Blackwell Ltd* (1990).
7. Jha, Girish N. "The System of Panini." *Language in India* 4.2 (2004).
8. Kak, Subhash C. "The Paninian approach to Natural Language Processing." *International Journal of Approximate Reasoning* 1.1 (1987): 117-130.
9. Kulkarni, Malhar. "Phonological overgeneration in Pāṇinian System." *International Sanskrit Computational Linguistics Symposium*. Berlin, Heidelberg: Springer Berlin Heidelberg, 2007.

10. Ostler, Nicholas. "Sanskrit studies as a foundation for computational linguistics." *Proceedings of the LESAL Workshop*, Mumbai. 2001.
11. Selkirk, Elisabeth. "On derived domains in sentence phonology." *Phonology* 3 (1986): 371-405.
12. Selkirk, Elisabeth. "The prosodic structure of function words." *Signal to syntax*. Psychology Press, 2014. 199-226.
13. Yogatama, Adiprana. "Phonological Analysis of Indian Language." *Register Journal* 5.1 (2012): 1-16.