

THE PHONOLOGICAL FEATURES OF HINDI STOPS

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The phonological features chosen to represent segments should a) reflect natural classes among the segments, and b) be non-arbitrary, i.e., empirically verifiable. The features proposed by Chomsky and Halle (1968) and Halle and Stevens (1971) for the series of obstruents found in Hindi more or less meet the first requirement; do they meet the second?

Using a plethmograph to measure lung volume and a pneumotachograph to sample oral air flow in the speech of one Hindi speaker, I sought to verify Chomsky and Halle's claim that aspirated stops are differentiated from others by the feature of 'heightened subglottal air pressure', which logically implies an active pulmonic gesture. Contrary to their claim I found no evidence of any active pulmonic involvement in the production of these segments. Rather, variations in the rate of lung volume decrement during all obstruents, aspirated or not, can be attributed to passive reaction to variations in the air flow escaping from the lungs due to variations in glottal and supraglottal impedance. The finding of high rate of flow upon release of [p^h] and [b^h], however is compatible with Halle and Stevens' claim that the vocal cords are abducted for these stops.

To test Halle and Stevens' claim that both [b] and [b^h] are produced with slack vocal cords, fundamental frequency (F₀) on the vowels flanking medial stops and sonorants was sampled and averaged over 10 tokens of each consonant type. F₀ was significantly lower on the vowel following [b^h], but there was no appreciable perturbation of the F₀ on vowels near the other stops. Thus Halle and Stevens are correct in their contention that vocal cord tension is used distinctively in Hindi stops but wrong in assuming that [b] and [b^h] have the same tension. Revised feature specifications of Hindi stops that meet requirements (a) and (b) above will be presented.

References

- Chomsky, N. and M. Halle (1968): The sound pattern of English, New York: Harper & Row.
- Halle, M. and K.N. Stevens (1971): "A note on laryngeal features", Q. Progress Report, Research Lab. of Electronics, MIT, 101, 198-213.