

Phonemes or Allophones? The case of [v] and [w]

This research looks at cross-dialectal differences which result in miscommunication, in a comparison of two dialects of English: American English (AE) and Indian English (IE). More directly it examines the acoustic realization of two phones in both dialects, [w] and [v] from AE speakers from the Bay Area of California and IE speakers from Delhi, India.

The phones [v] and [w] have disparate status across the two dialects: they are distinct phonemes in AE, but have been hypothesized, based only on earlier auditory impressionistic analysis, to be allophones of the same phoneme, [ɣ] in IE (Agnihotri 1994). This paper analyzes the two phones both acoustically and through a perceptual study of the collected speech samples, as presented to ~130 AE speaking college undergraduates.

The phonetic analysis elucidates what, if any, acoustic cues exist in the IE data that may aid in distinguishing the two phones. Drawing on this, this paper then explores potential intelligibility breakdowns between IE speakers and AE listeners with a perceptual study, focusing specifically on this phonetic contrast. Examining IE input presented to AE speakers, rather than the opposite, is chosen because it focuses on how speakers with the v/w contrast interpret speech which has less, if any phonetic, and contrast, and hence, perhaps no phonemic contrast. The acoustic and perceptual studies complement each other and allow both a more comprehensive understanding of the acoustic properties of the two phones across two dialects, and how contrasting acoustic cues' presence or absence promotes and hinders intelligibility.

By examining the target phone quality, the transition quality and the following vowel's quality, this paper finds that AE [v] is clearly fricated, AE [w] patterns as a non-obstruent, and IE [w] and [v] pattern more closely both to each other and to the AE [w] in all respects. While AE has two phonemes with disparate acoustic signatures, IE has one phoneme with no consistent acoustic differences, and both target phones pattern very similarly both to each other and to the AE [w]. The perceptual study explores overall accuracy across dialects, the role of context in accuracy, and the direction of error transpositions within IE data, showing that the accuracy rate is considerably higher for AE input than IE input, that accuracy is aided by context, though not as strongly as might be assumed for the IE data, and that the direction of IE error transpositions correlates with the acoustic data: IE [v] is much more likely to be misheard as [w] than the opposite.

This pairing of two sets of data and analyses has demonstrated the strong links between acoustics and intelligibility. Further, it settles the phonemic status of [v] and [w] in IE, while also offering acoustic explanations for perceptual mistakes made by AE speakers, who have and expect a clear w/v phonemic contrast.

References

- Agnihotri, R.K. 1994. Sound Patterns of Indian English: A Sociolinguistic Perspective. In *Second Language Acquisition: Socio-cultural and Linguistic Aspects of English in India*, R.K. Agnihotri and A.L. Khanna, Eds. Sage Publications: New Delhi. 198-207.