

DIMENSIONS OF TONE SYSTEMS

Ian Maddieson, Phonetics Laboratory, Department of Linguistics, University of California, Los Angeles, CA 90024, U.S.A.

This paper describes patterns in tone systems in terms of an understanding of the relative importance of the dimensions along which tones may contrast, and explains a marked typological dissimilarity between tone and vowel systems as resulting from the different kinds of dimensionalities that underlie tone and vowel systems. Reliable data on tone systems has been assembled through a survey of over 300 tone languages. This survey shows that 2-tone systems are the most frequent. Each added tone reduces the frequency of occurrence. While 2- and 3-tone systems generally have only level tones, both level and contour tones are commonly included in 4-tone systems. 5-tone systems generally include level, rising and falling tones. Contours moving in the same direction but differing in the amount of their pitch change are typically found only in larger tone inventories. Thus, the smaller and more common inventories exploit only contrasts of pitch level, larger inventories add contrasts along a dimension of pitch movement, and the most elaborate and least common inventories also use contrasts of amount of pitch change.

The ranking of these 3 dimensions corresponds with the ranking of the cognate dimensions of average pitch, direction and slope found by Gandour and Harshman (1978) in a study using multidimensional scaling techniques to determine the perceptual dimensions distinguishing an inventory of 9 tone shapes. In this case the ranking implies, roughly, that subjects relied most on average pitch to discriminate between tones, then next they relied on direction, and so on. The correspondence suggests that tone inventories are elaborated by recruiting progressively less salient perceptual dimensions. In contrast to tone dimensions, perceptual dimensions of vowel quality are not ranked in a hierarchical fashion (Terbeek, 1977). However, vowel quality inventories almost invariably contain multiple terms (most frequently 5). Whereas vowel systems seem to be inherently multidimensional, tone systems only become so when they become elaborated.

References

- Gandour, J.T. and R.A. Harshman (1978): "Cross-language differences in tone perception: a multidimensional investigation", L&S 21, 1-33.
- Terbeek, D. (1977): "A cross-language multidimensional scaling study of vowel perception", UCLA Working Papers in Phonetics 37.