CHAPTER 6

Phonetics in Phonology: A Cross-Linguistic Study of Laryngeal Contrast

Heriberto Avelino

1 Introduction

During the last decade there has been an increase in phonetic studies of phonation in languages of the world (Gordon and Ladefoged 2001, Michaud and Mazaudon 2006, Keating et al. 2011). Languages of the Americas have had a preponderant role in providing data to show the possibilities of human languages in controlling laryngeal structures and dynamics for linguistic functions (Avelino 2010, Blankenship 2002, Ladefoged 1988, Silverman et al. 1995).

Descriptive grammars of diverse language families in the Americas include labels such as ‘rearticulated’, ‘glottalized’, and ‘aspirated’, among others, to describe phenomena that can be interpreted as the contrastive use of laryngeal settings in producing vowels. These accounts, based on the ample experience of fine fieldwork linguists, while not being intended to be phonetically elaborated, strongly suggest that in some languages there is, at least, a triple-way contrast in phonation, modal-laryngealized-aspirated, as in some Otomanguean and some Mixe-Zoquean languages, while others have only a modal-laryngealized contrast, as in Mayan or Nadahup, for instance. However, phonation is not the only prominent laryngeal feature in languages of the Americas; early studies such as Sapir (1922) and Pike (1948) described complex tone patterns in the languages of the new continent. Tone can be found throughout the Americas, from North American to Mesoamerican to Amazonian languages, among

* I would like to thank the speakers of the languages who participated in this study Ana Daysi Alonso, Atanasio Dzib, Dianela Marin, Engracia Perez, Estela Canseco, Federica Diaz, Francisco Limeta, Jose Bollo, Margarita Cortez, the late Mario Molina, Pascual Vera, Rodrigo Martinez, as well as those who preferred to remain anonymous. Thanks to Jaime Morales, Joel Aquino, Juana Vazquez, Victor Canto, Xilonen Luna for facilitating the fieldwork; I am grateful for the comments, suggestions and discussion to Christfried Naumann, Christian Dicanio, Didier Demolin, Donca Steriade, Frank Seifart, Harald Hammarström, Henrik Bergqvist, Ian Maddieson, John Ohala, Jonathan Amith, Larry Hyman, Lyle Campbell, Martin Haspelmath, Melissa Freizer, Pam Munro, Paul Haggerty, Peter Ladefoged (†), José Elias-Ulloa, Ryan Shosted, Søren Wichmann, Susanne Michaelis, the members of the UCLA American Indian Seminar and the Seminar at the MPI-EVA, Leipzig. I am the sole responsible for the contents of this article.
others, in systems that show a great divergence on a number of factors such as the number of tones, the grammatical use of tone, and morphophonological sandhi-like processes. Although, in general, it is frequent to find voice qualities associated with different tones (e.g. creaky voice is often associated with low tone (Huffman 1987, Cao and Maddieson 1992)), what makes languages of the Americas special is that to some extent tones and phonation are independent features, so that in some languages all tone-phonation combinations are attested.1 Indeed, this pattern is predicted from a purely phonetic perspective. Ladefoged (1973), for instance, pointed out that the ‘features of the larynx’ can be controlled independently and therefore can coexist in a single phonological system (see also Hirose 1997). Later work (Silverman et al. 1995, Silverman 1997, Blankenship 2002, inter alia) further showed that the coexistence of underlying features does not entail simultaneity, but the features can be implemented phonetically as ‘phases’ across the duration of the vowel, so that the course of non-modal phonation does not persist through the entire vowel. In spite of the relative independence of the features of the larynx, and considering the recent findings on the timing in the implementation of non-modal phonation, I would like to add another piece to the discussion by arguing in this chapter that the phonetic implementation of tone and phonation, in particular the loci or anchoring of modal and non-modal phonation within the span of the vowel, depends also in part on the phonemic status of these features in the particular language(s). More specifically, I claim that although purely phonetic considerations (e.g. bio-mechanical or acoustic) give solid grounds to the explanation of tendencies in sound patterns, they cannot alone explain nor predict the patterns of allophonic variation observed across languages. Thus, the goal of this chapter is twofold: First, to provide an analysis of the phonetic properties of non-modal phonation in three languages, Yalálag Zapotec (Otomanguean), Yucatec Maya (Mayan) and Santa María Ocotepec Mixe (Mixe-Zoquean); and second, to test the phonological hypothesis that the patterns of phasing of tone and laryngealization throughout the vowel depend on the number and inventory of tone categories, so that in languages with crowded inventories, as in Yalálag Zapotec, in which both laryngeal dimensions are contrastive, the underlying features do not overlap. The null hypothesis predicts that the phonetic implementation of tone and phonation will be maintained, while

1 Thanks to Leo Wetzels for pointing out that other languages, such as Bor, a dialect of Dinka, spoken in South Sudan contrasts three tones and four types of phonation. Indeed, other languages of the world may have orthogonal contrasts, however, in languages of the Americas this property is spread all over the continent including different unrelated families and linguistic areas. The status of this feature, whether it is a contact phenomenon or can be traced back to an old genealogical trait deserves further investigation.