Speech between field and laboratory: data, models and theories.

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The study of the diversity of sound systems of natural languages presents many challenges. On the one hand, one must collect as much data as possible on the observed phenomena in the languages of the world. On the other, these data must be acquired with reliable measuring devices in order to be reliably quantified.

The variety of facts that can be observed in very many language families often faces the challenge to be confronted with phonological models. Confronting data with models of speech production and perception may allow for a better understanding of how the observed phenomena might be integrated, thus permitting discussion of the limits of available models.

Phonetic and phonological exploration of some languages spoken in South America may be used to illustrate these remarks and discuss a number of poorly understood phenomena. Some examples follow.

The existence, in the Tupi language branch, of vowel systems which do not exhibit posterior closed vowels is a case in point, and permits addressing issues related to the theory of vowel dispersion.

The phonetic description of sounds of which there is proof of existence but not included in the IPA chart may initially rely on the acoustic theory of speech production. The phonetic description of such languages' sound changes can offer an explanation for similar phenomena observed in other language families of the world.

For example, the existence of nasalized fricatives, both voiced and unvoiced, points to the limits of certain theoretical explanations, which thus need reformulation. Another example is the phenomenon of nasal co-articulation in languages with nasal harmony. Yet another example lies in certain manifestations of glottalization which involve a complex relationship between speech production and perception, raising the question of the level of representation of phonetic features or gesture primitives.