

Bilabial trills belong to the normal inventory of some of the world's languages but remain quite rare in general. Such sounds have been signalized at different places on the globe. Ladefoged (1971) (quoting Pike 1963) has mentioned trills in Amuzgo and Zapotec, two languages spoken in Mexico. However Maddieson (1989: 112) claims that their distribution is very limited in these languages where their function is mainly ideophonic. Ladefoged, Cochran and Disner (1977) have also reported such sounds in Papua New-Guinea, among Austronesian languages spoken on Manus and neighboring islands. Maddieson also signals them on Malekula Island in Vanuatu and in some western Malayo-Polynesian languages spoken at different places in Indonesia. In Africa, Tucker (1944), Tucker and Bryan (1966), Thomas (1981) and Pasch (1986) have mentioned bilabial trills in non-Bantu languages from the North-East of Congo. Thomas (1981: 261) uses the term vibrating bilabials for languages belonging to the Mangbetu-Asua group. Thomas equally mentions their existence in Bongo-Gberi and in Binga-Kara, two sub-groups of the eastern branch of Central Sudanic languages. In these sub-groups, Caprile (1981: 262) quotes bilabial trills in Kresh, Kara, Binga, Yulu, Baka, Bongo and Beli. Pasch (1986: 180) describes such sounds in Dongo, an Ubanguian language spoken in the Northeast of Congo. Ladefoged (1971: 53) has mentioned trills in Ngwe, a language spoken in West Africa and Maddieson (1989: 91) reports that such sounds can also be found in a small group of Bantoïd languages from the Cameroonian grassfields (Hyman 1980). Benko and Imre (1972: 318) have equally reported bilabial trills in the East and in the Northeast of Hungary. In addition to these observations, Ladefoged & Everett (1996) and Gabas Junior (p.c.) mention voiceless apico-dental plosives followed by voiceless labio-dental trills in Chapakuran and Tupi languages of Brazil.

The phonological bilabial trills (prenasalized, voiced and voiceless) that will be examined in this paper belong to the normal inventory of some Moru-Mangbetu languages. These languages allow discussing several important questions concerning these sounds. Why do prenasalized bilabial trills appear in these languages? Is it necessary to have a nasal in part of the environment to favor the development of a bilabial trill? Does a single voiceless bilabial trill exist and if so which are the phonetic characteristics which differentiate them from voiced bilabial trills? Maddieson (1989) claims that bilabial trills only develop in a well-defined phonetic environment, i.e. with prenasalized stops, in which the obstruent part is voiced, followed by a vowel involving a small lip opening (e.g. [u]). Maddieson hypothesizes that this particular environment contains the specific conditions for trills to develop spontaneously. However, Catford (1988) data in Nias (a language spoken in Sumatra) force him to consider that, at least for this language, bilabial trills are not conditioned by the following vowel, even if they develop with prenasalized bilabial stops. The experimental data presented in this paper show that the answer to these questions reveal important facts about the control of speech production mechanisms and its relation to cognitive aspects of speech. For example, the fact that high back vowels seem a favorable environment for bilabial trills is not as important as the lips relaxation in their production. This parameter is indeed essential to generate the Bernoulli effect on the lips and this explains why bilabial trills are possible before front vowels.