LINGUISTIC AND EXTRA-LINGUISTIC SOURCES OF VARIATION IN VOCAL SYSTEMS: PHONETIC APPROACHES TO THE EFFECTS OF SPEECH STYLES OVER ORAL VOWELS IN EUROPEAN PORTUGUESE

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ABSTRACT
The study of speech presupposes the description of an extremely complex production process, not only because of the quantity of information that is transmitted, but also because of the great variability of the parameters at stake, and of measurement difficulties.

The sound is transmitted due to pressure variations in the surrounding milieu. Unlike many researchers have previously thought (namely Fant, a known researcher), the sign of speech is not only a physical entity. These researchers considered vowels as a periodical phenomenon without any other characteristics. Phenomena linked to the production of vowels, and the parameters influencing the vocalic structure, have been the object of an important number of studies. The interaction between acoustics, fluid dynamics and electronics has allowed for the elaboration of vocal tractus models and also of methods aimed at measuring the formants frequency. The main stages of this evolution are presented in the first part of the work.

The limitations of theories elaborated on such a basis became clear when phoneticists started being interested about the problems of synthesis and speech recognition. The fact that the human variable linked to communicative aspects was also taken into consideration has allowed for the elaboration of new models. In particular, this is the case of the interaction between socio and psycolinguistics that is on the basis of the introduction of the concept of “speech styles”.

There are several reasons for the interest in continuing the research work on the influence of speech styles. On one hand, they demonstrate the inevitable character of the importance of human behavior. On the other hand, they allow for a rethinking of the definition of vocalic structure, which is a source of progress in the treatment of the speech sign.

This research is aimed at observing the effects of speech styles over the vocalic structure and to stress out a logic in the dynamics of the movements of vocalic structure elements. The other objective is to propose a new modelisation.

Some romanic languages had already been analysed from this point of view. There are two opposite styles: spontaneous speech and laboratory speech. In this research, the language selected as study object is European Portuguese. One of the chapters of this thesis has been developed around the evolution of the work produced in the field of Portuguese Phonetics since 1883, and also around the description of the phenomenon of vocalic reduction.

With the participation of ten Portuguese speaking elements, one living in Belgium and the remaining in Viseu (Beira Alta, Portugal), the experimental results, along with a statistical treatment, have revealed significant changes in the organization of vocalic dispersion zones and, as a consequence, also in the degree of “risk of confusion” during vowels production. The system composed of vocalic productions is in perpetual mutation. The variation and plasticity of vocalic structures show how these are dependent on human oral communication.

In the case of spontaneous speech, the dispersion areas tend to expand and distance themselves from the vocalic structures periphery. The speaker hipoarticulates. This is why it is possible to draw out the conclusion that vocalic reduction is a very complex
phenomenon, which cannot be resumed to a simple centralization of productions at the formantic dimensions: it implies a balance between two apparently antagonistic aspects characterizing the speaker – a wish for minimized effort, combined with the intention of interacting with the external world.

The concept of centralization is discussed after the observation of results, and the expression ‘withdrawal from the periphery’, applied to spontaneous vocalic operations, is approached as the most relevant one. This movement is quantified through an angle calculation in the vocalic structures. This way, the initial model is improved substantially. This process of withdrawal follows a direction which is dependent not only on the speaker but also on the vocalic category, and it occurs along with a variation on the surface. At a time level, vowels produced in spontaneous speech have a reduced duration when compared to those observed in laboratory speech.

The results achieved, and also the many ways these are approached, have led to a reflection on co-articulation. The influence of surrounding sounds, an elementary definition for co-articulation, seems to be more significant in laboratory speech. The relation established between this research and combining phonetics phenomena are the basis for the development of further studies, which will now have to consider the variation of speech style through an interaction with a very complex form.