

PHONETICS – AN INTERVIEW WITH LUIZ CARLOS CAGLIARI

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ReVEL – What were the founding works in phonetic research? When did Phonetics begin to be thought of as a subarea of linguistics independent in a certain way from Phonology?

Cagliari – Phonetics is a matter of investigation older than humanity in relation to language. While observing speech, all of the creators of writing systems had to search for guidelines in order to form those writing systems. This is particularly clear in the case of the creation of the alphabet. Once a writing system is created, orthography necessarily emerges, so as not to let writing vary uncontrollably. Orthographers were always good phoneticists. Little by little, grammaticians explained the sound production mechanisms of speech. The great turning point occurred when the necessity to study ancient scripts arose, with the archaeological discoveries of the 18th century, at the same time that a concern with the origin of languages began to appear. The comparativists of the 19th century had to define Phonetics on a more solid basis. In the same time period, great dialectology studies emerged, which naturally used Phonetics an essential tool. And so phonetic alphabets such as the IPA (of the International Phonetic Association) emerged. At the turn of the 20th century, the world saw enormous scientific, technological and industrial development. Research into the sounds of speech created laboratories. Equipment for speech analysis emerged, such as the kymograph, the X-ray, the palatogram, etc. Three great phoneticists stand out in that time period: Abbé Pierre Rousselot, in France; Structure, in the United States; and Dainel Jones in England. From that time period on, phonetics followed two parallel paths which were not incompatible, but not always in agreement. One of them came from the long tradition of speech production

and was dedicated to the study of the mechanisms of speech production. One great phoneticist along this line has been Henry Sweet, in Oxford. Daniel Jones, who was his student, and David Abercrombie, who was Jones's student, continued this tradition with a noteworthy contribution, seeking to reconcile articulatory and auditory phonetics with laboratory phonetics. Working in Edinburgh, M. A. K. Halliday developed descriptive models of prosody, a theme that began to raise great interest in phonology. In the United States, Kenneth Lee Pike founded the Summer Institute of Linguistics (SIL) and positioned phonetics as being closely related to phonemes and other levels of grammar (tagmemics). In Germany, the work of Von Essen and, in France, the works of M. Grammond stood out in the history of phonetics. All of these phoneticists contributed in a very significant way to the development of phonetics. The other path of phonetics is that of laboratory research. The Swiss phoneticist Gunnar Fant, who had many connections with Edinburgh, developed the fundamental principles of the acoustic theory of speech and built prototypes of speech synthesizers, based on the ideas of the Japanese phoneticists Chiba and Kayama. Laboratory phonetics had other concerns that were not only acoustic studies. Many studies of anatomy emerged, as well as studies of the physiology of speech production mechanisms, of aerodynamic mechanisms, and of perception and hearing. This history has details which will not be mentioned here. Phonetics was built as the fundamental work of many researchers and professors. Still, if I had to indicate which people contributed most to the history of phonetics, creating a well-designed path and enriching phonetics with its best qualities, I would say that they were Henry Sweet and Gunnar Fant. Phonetics before them and after them is very different.

The question above raises another question which I will try to follow. It concerns the relationship between phonetics and phonology. In truth, phonetics was always connected to linguistic studies, as ancient grammars show. With Ferdinand de Saussure, there was a break in theory, but not in practice. This was so true that it was rightly in the structuralist approach that phonetics had its most significant development. Immediately after the mid-20th century, the distinctive properties of phonology emerged, with the studies of a linguist (R. Jakobson), an engineer (G. Fant) and a phonologist (M. Halle), uniting the articulatory, auditory and acoustic characteristics of sounds. This was an important point between phonetics and

phonology. Since then, phonetics began to be concerned in the strictest sense with other levels of linguistic analysis. Generative phonology, such as prosodic phonology, only advanced because phonetic studies in that area also progressed greatly. With the ease of acoustic investigation of speech in current computers, many studies have recently appeared which concluded in questionable statistical procedures, leaving to the side the strict relationship that the sounds of speech have with phonology and with language in general. These are studies without linguistic value, because they do not seek to describe language as speakers understand it, but rather the audible characteristics of speech as physics understands it.

ReVEL – What is your opinion of phonetics not being an independent discipline in undergraduate courses, having its place only in phonology or general linguistics courses? Could this reflect the fact that there are few groups of linguists dedicated to phonetic studies in Brazil?

Cagliari – Before saying anything else, it is necessary to discuss the programmatic content of what should be an undergraduate course in Portuguese and/or languages. What is and is not relevant? In my opinion, these courses are poorly structured, in a general sense. Digressing a bit from this question, concerning the teaching of phonetics (and phonology), a class that is three hours a week per semester would be enough for a professor to teach the basic theoretical elements of phonetics and phonology, train students in some techniques of laboratory phonetics, develop good training of production and transcription of the sounds of speech, starting from human articulatory possibilities, aside from training them in phonological description and analysis. What I observe is that there is an inequality in programs, with little emphasis in the central areas of linguistics (phonetics, phonology, morphology, syntax, semantics, pragmatics, discourse analysis) and an excess of materials for education (internships, etc.) or languages (Latin, Greek, modern languages, literature). Within linguistics, it is not uncommon that there is an exaggeration in the studies of discourse and texts, with prejudice on other also essential areas. On the other hand, there are not enough university professors to allow all schools to have appropriately prepared people. In recent years, we've educated many professors in the areas of discourse and almost no one in the areas of

phonetics and phonology, in post-graduate courses. In Brazilian universities today, are there people who are appropriately prepared to teach, for example, cardinal vowel theory, in order to make a rigorous training in transcription and production of the sounds of speech, to work with laboratory phonetics within a linguistic vision of the phenomenon? These are essential abilities for a linguist professor, not just specialists in phonetics. And a professor that comes out of a Portuguese program has to be, above all, a linguist.

Answering the second part of the question, it seems obvious that if we do not educate people interested in the area, in post-graduate courses, we are not educating researchers. Without researchers no research groups are created. Thus, we create a vicious circle. Despite this general situation, it can be observed that, in certain places, there are small groups of researchers carrying out interesting studies which are relevant to phonetics in this country. It is also observed that our universities do not dispose of minimal resources for development of activities of a material such as phonetics. There is a need for expensive equipment, which is never a priority in school budgets or in the opinions of research financiers. Still, there are negative opinions that phoneticists customarily adopt in their projects and studies, because our colleagues think that phonetics is something minor, secondary or even disposable. All of these factors have contributed to an enormous decrease in the education and performance of phoneticists among us. Finally, groups that work with indigenous languages maintain a descriptive practice with indispensable support from phonetics. Since interest in phonetics has decreased, these areas of research and study also begin to decrease. On the other hand, indigenous languages begin to awaken interest in other levels of linguistics, such as discourse. However, if there are not basic descriptions of the language, there will not be data for study on other levels, such as discourse.

ReVEL – What is the focus of studies that are considered cutting-edge in phonetics today?

Cagliari – From the point of view of articulatory and auditory studies, the most current focus is turning towards prosodic research: intonation, rhythm, etc. In Brazil,

there is a study that comes from a long tradition, researching linguistic variation in the country. However, the most advanced studies in the area focus on automatic speech recognition for machines. Due to enormous difficulties, studies advance very slowly. But there are already interesting results. These studies are based on the search of algorithms derived from an enormous quantity of recorded speech and processed with the goal of obtaining unchanging acoustics within the chaos of speech variation of a language. This type of research was only possible after computers arrived at their current configuration in terms of processing speed and memory. While the most desired results do not, some studies seek to resolve more localized problems, for example, trying to move from phonetic (or phonological) transcription to orthographic transcription. Engineers are not very interested in this type of research, because phonetic transcription is not something that they need, except in very specific situations. Close to fifty years ago, other approaches were suggested, but were discarded because, in those years, there were no computational conditions to implement them. Today, no one is concerned about them, however, they could bring up some new contribution. As we have still not arrived at an ideal point in synthetic speech production, there are some studies aiming in this direction. One type of research that has stood out in recent years is the production of computer programs capable of changing orthographic writing into synthetic speech production. Another focal point of cutting-edge research today is neurolinguistic investigation. Phonetics has a special role in this type of research. Interestingly, the two most outstanding focal points in current studies do not have the immediate goal of describing phonetic characteristics of languages, but rather of contributing to advancement in other areas.

ReVEL – What interfaces with other subareas of linguistics does phonetics present today, aside from studies that create the interface between phonetics and phonology?

Cagliari – From the answers discussed above, it is clear which interfaces have been established between phonetics and other areas, aside from the direct interface with phonology. The interface that is most used today is without a doubt the interface with communication engineering; telephone communication, synthetic speech, written

production from speech and automatic speech recognition done by machines. Another interface which has had great interest from both parts is the one which unites phonetics with neurolinguistic studies, especially speech pathology and speech therapy. In a substantially reduced dimension, phonetics maintains an interface with other areas, in which studies of the sounds of speech are important elements. In this way, phonetics has contributed to studies on literacy, reading and the formation and use of writing systems. It has also contributed to the specific study of some aspects of literary theory, such as studies on poetry, meter and style, and has even shown textual characteristics related to the attitude of the speaker, for example. This interfaces have helped to concern phonetics with aspects of oral language that did not always stand out or receive special attention. Obviously, the great concern of phonetics is with the system of language and, in that sense, phonetic studies, although they are linked to extralinguistic areas, become a reinterpretation of phonology and other linguistic areas and do not go beyond linguistic studies. In this sense, the performance of sound engineers cannot be considered a linguistic activity. There is nothing required in return, aside from the engineering work for the linguistic description of languages. The equipment deceives more than it describes. It is the ear and the human mind that interpret, having, in the language system, their interpretive program, not machine programs, at least according to the state of current investigations.

ReVEL – As an expert in the area of Phonetics, could you suggest some books that language and linguistics students could use to begin or even develop their study of Phonetics?

Cagliari – One of the problems that language professors run into is due to the fact that many students only read texts written in Portuguese. A great part of the current technological and scientific production in many countries is published or distributed in English. Without knowing English, it is difficult for a student to obtain a truly complete education. Since the whole world studies English, it does not make much sense to translate many kinds of texts written in English into all the languages of the world. On that note, I will present below a basic bibliography for an undergraduate course in Portuguese and languages. Other choices would be perfectly valid, because

there are many books on the same subject. Of the books I have listed below, the first two are the most important and should be in the basic library of every teacher of Portuguese or other languages.

1. Basic books:

ABERCROMBIE, David (1967) *Elements of general phonetics*. Edinburgh: Edinburgh University Press.

LADEFOGED, Peter (1975) *A course in phonetics*. New York: Harcourt Brace Jovanovich, Inc.

2. Important complementary works:

CATFORD, J. C. (1988) *A practical introduction to phonetics*. Oxford: Clarendon Press.

CATFORD, Jan C. (1977) *Fundamental problems in phonetics*. Edinburgh: Edinburgh University Press.

FANT, Gunnar (1968) "Analysis and synthesis of speech process." *Manual of phonetics*, ed. Bertil Malmberg. Amsterdam: North-Holland Publishing Co., pp. 173-277.

FRY, D. B. (1979) *The physics of speech*. Cambridge: Cambridge University Press.

LAYER, John (1994) *Principles of phonetics*. Cambridge: Cambridge University Press.

3. Works in Portuguese:

FERREIRA NETO, Waldemar (2001) *Introdução à Fonologia da Língua Portuguesa*. São Paulo: Hedra.

MASSINI-CAGLIARI, Gladis & CAGLIARI, Luiz Carlos (2001) Fonética. in: *Introdução à Lingüística: domínios e fronteiras*, MUSSALIM, Fernanda & BENTES, Anna Christina (org.). São Paulo: Cortez. pág. 105-146.

SILVA, Thaís C. (1998) *Fonética e fonologia do português*. São Paulo: Contexto.