Proceedings of
The XIVth International Congress of Phonetic Sciences

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Sponsored by: University of California, Berkeley

Edited by: John J. Ohala, Yoko Hasegawa, Manjari Ohala, Daniel Granville & Ashlee C. Bailey
## PAST CONGRESSES

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NOTE FROM THE CHAIR

The 1999 International Congress of Phonetic Sciences is the 14th of this series that started in 1932. Jacques van Ginnekin was the organizer and guiding spirit of the first ICPhS, organized in Amsterdam. He explicitly advocated an interdisciplinary meeting devoted to the exchange of research results on speech from varied disciplines: linguistics, the clinic, psychology, language teaching, etc. Against all odds – given the inevitable trend towards increasing specialization – the interdisciplinary character of this meeting has survived even after 67 years. The 14th ICPhS features papers from the original group of disciplines as well as from speech technology, perhaps the most rapidly developing field within the phonetic sciences. I believe all practitioners of the phonetic sciences are united in trying to understand how speech works. Certainly many facts and principles on the workings of speech have been accumulated over the decades, but there are still many fundamental questions left unanswered and even unexplored. Answers or even hints to possible answers can come from any of the disciplines within the phonetic sciences. Whatever solves a problem in psychology can solve problems within linguistics, whatever solutions work in speech technology may work in the clinic, etc.

I encourage participants of the congress and readers of the proceedings to devote some time to sampling the research reports from areas outside their own chosen discipline. Good ideas can come from any source and in particular they come from a melding of ideas from diverse sources and viewpoints.

I personally believe that the phonetic sciences may be on the verge of some dramatic scientific breakthroughs. Certainly the pace of research on spoken language has increased dramatically within the past few decades. The practical applications of phonetic research via speech technology has been one of the major forces in this acceleration. The accessibility and affordability of research tools due to the ‘digital revolution’ is another factor in this development. Several unifying theories on how speech works have been proposed: the motor theory of speech perception, the direct realist theory, action theory, quantal theory, the theory of adaptive dispersion, etc. These are currently being evaluated and debated and will, no doubt, lead to a new synthesis of our understanding of speech. Perhaps a hint of these breakthroughs may be found in papers presented at this congress. I urge the proceedings reader to find these leads!

The 14th ICPhS is the first to be held in the United States. Supposedly the 4th ICPhS was scheduled to take place in New York in 1941 but was canceled due to complications created by World War II. When the series was re-started in 1964 the host city was Helsinki. With the exception of the 7th ICPhS in Montréal in 1971, all previous congresses took place in Europe. The United States phonetic sciences community is proud to host this congress, the last in this century.

John J. Ohala
Chair
NOTE FROM THE EDITORS

Dear colleagues,

We hope these proceedings will be a useful resource for your future research. The papers in these volumes cover many areas in the current field of the phonetic sciences.

Each volume begins with some general information about the congress which is followed by a table of contents for all papers in each volume of the proceedings. After the papers is an index of authors, advertisements, and a general program schedule for ICPhS99.

The scientific contributions presented at the congress were in four forms: plenaries, symposia, poster sessions, and oral presentations.

The symposia were organized by experts in topics considered of general interest to the congress attendees. The leaders were accountable for inviting other specialists to participate in their symposia. All symposium contributors submitted four page papers for inclusion in the proceedings.

For the poster and oral sessions 810 abstracts were submitted. 711 (88%) were accepted. Of these 95 withdrew or were removed from the program because their papers were not received. Some accepted authors were also asked to join symposia. Therefore, including the symposium and plenary papers, as well as 6 papers which are not to be presented at the congress but are to be included in the proceedings, there are 642 papers in these proceedings. With the exception of the five plenary contributions of a maximum of 8 pages each, the papers in these volumes are at most 4 pages long.

There is also a print version of these proceedings. Some authors submitted multiple versions of their papers after the paper submission deadline. Because of this, it is occasionally the case that a paper in the print proceedings will differ from its counterpart on the CD ROM version of the proceedings. Please note that the CD ROM contains the most up-to-date version of each paper.

We are pleased to have papers presented by phoneticians from 46 countries. The following page gives a list of the nations represented by the first authors or their contact person if the first author’s residence was not given to us. Many papers have authors from different countries, however only the nations of the first authors are given below.

We hope enjoy these proceedings and find them to be worth the efforts of their editors and contributors.

The editors
STATISTICS FOR THE ICPHS99 PROCEEDINGS

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66 Total 642

NUMBER OF CONTRIBUTIONS PER COUNTRY

This list is taken from our database and represents the first author wherever possible. On occasion we had only the address of the contact person.

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♦ Office of Dean of Social Sciences, UCB
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♦ Panasonic Technologies, Inc., Speech Technology Laboratory, Santa Barbara, CA

The following professional societies are official co-sponsors of the ICPhS 99:

♦ Acoustical Society of America
♦ Australian Speech Science & Technology Association
♦ European Speech Communication Association
♦ International Phonetic Association
♦ Linguistic Society of America

Our thanks go to the abstract reviewers for their help in maintaining the quality of papers in these proceedings.

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