Message

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Dear colleagues,

This is to express my warmest congratulations and the best wishes of success for your Research Institute of Logopedics and Phoniatrics. I and my colleagues of the Speech Transmission Laboratory join me in these congratulations. The program of research for the Speech Science Section of your Institute is of special interest to us since our former colleague Osamu Fujimura has been our colleague for a substantial period of time and has a solid international reputation. The program of your Speech Science Section parallels our own program in this field and we will have a profound interest in all phases of your coming work. Here follows some comments on our joint interest in speech research which you are free to publish in your institutional report.

The study of speech physiology is an area of common interest. We are highly interested in your efforts to substantially minimize the X-ray dose needed in cineradiography. The possibility of using ultrasonic techniques for vocal tract measurements has also been considered here recently and we plan to continue and expand the work on EMG techniques and optical measurements. It would be especially welcome if someone could develop experimental techniques for continuous measurements of the coordinates of a single point within the speaking organs, e.g. by ultrasonics or by electrical or magnetic field disturbance methods.

We have recently tested the Fabre method of electrical resistance measurements for indirect registration of vocal cord activity. A report will be included in the forthcoming issue of our Quarterly Progress and Status Report (QPSR 4/1966). This technique, that has been further advanced by Dr. Jana Ondráčková of Prague, proved to be a valuable supplement to optical glottography and inverse filtering.

There are many physiological facts related to speaker category that need to be investigated. This is apparent not only when studying the voice source attributes but also when studying the natural constraints of the vocal tract. The pioneer work of Chiba and Kajiyama gave some data on the nonuniform scale factors comparing females, males, and children. A note on these scale factors is also to be found in our most recent progress report (4/1966).

Your list does not explicitly take up speech perception problems but I know that they will receive a good deal of attention anyhow. For example, we have a common interest in the perception of vowels. Your study on the perception of the higher formants of front vowels reported first in our QPSR and to be published more extensively in Language and Speech provides evidence against the concept of the

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higher formants as a single stimulus, uniquely represented by its mean value. This survey should be extended to enable a closer correlation between vowel quality and acoustic structure. It would, for instance, be needed to investigate possible trading relationships between relative formant amplitudes and their center frequencies.

There are many interesting details to be studied on the various levels of speech production and perception. Now and then, however, we need more complete and integrated studies of the major functional problems. When will someone write a comprehensive monograph on the voice mechanism in its physiological, mechanical, aerodynamical, and acoustical aspects? When will we have an up-to-date textbook on the language of Visible Speech? The general theory of synthesis by rules is a closely related subject that can provide the grammar of the language. Coarticulation models with reference to neuromotor commands provide the backbone but numerical constants and other contents cannot be specified without the access to an extensive and systematic spectrographic material. Inverse transforms from acoustic structure to physiological states will be a valuable complement to the straightforward synthesis and check against available acoustic data as means of determining the important constants. This trend in our research methods will hopefully not inhibit our studies of speech perception by reference to the motor theory. Even if speech perception works with the same minimal categories as speech production we need to evaluate the relative importance of cues within a feature and to learn about the major constraints in perception. Such knowledge will also be of basic importance in developing methods of speech correction for auditory handicapped people.

We are keenly looking forward to your coming publications. Our warmest congratulations.