Speech Sciences (speech acoustics and experimental phonetics)

Faculty of Health and Welfare
Department of Communication Disorders
Professor （Name） Michiko Hashi

Prefectural University of Hiroshima Office 3513
Tel 848-60-1158 Fax 848-60-1134
E-mail hashi@pu-hiroshima.ac.jp
URL http://www.pu-hiroshima.ac.jp

Research Fields： experimental phonetics

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●Research Topics

1) Inter-speaker Variability in Articulation

Human beings vary in their behaviors including speech articulation. However, little is known about inter-speaker variability in articulation due to difficulties in data acquisition and analysis. My research on this area primarily involves the X-ray microbeam Speech Production Database in Japanese and English, which offer multi-talker articulatory data. Examples of such work include articulatory variability in American English /r/ and Japanese moraic-nasal /N/. It was found that articulatory variability across speakers was substantively greater than commonly-accepted types found in most textbooks in phonetics in respective languages.

2) Effect of Speaking Rate on Articulatory Behaviors

Abnormal speaking rate has been considered ~~as a~~ a major characteristic of disordered speech and speaking rate manipulation has been used as means of intervention. Yet little is known about the effect of change in speech rate on articulatory behaviors both in normal and disordered speech. The current work concerns establishing statistically-defensible normal articulatory behavior across speaking rate and develop descriptions of disordered articulatory behavior by comparing it with established normative data with equivalent speaking rate. Such work will enable us to understand the nature of articulatory behavior in speakers with motor speech disorders in relation to the effect of speaking rate.

3) Effect of Posture on Acoustic Characteristics of Speech

Postural changes bring about changes of the direction of gravity toward the human body including the vocal tract, which, in turn, may well cause changes in the acoustic characteristics of speech produced in different postures. This is of particular importance in speech pathology where clinicians have to deal with clients in various postures. This work attempts to examine differences in acoustic characteristics of vowels produced in upright and supine postures.

4) Use of Automated System in Assessment of Speech Intelligibility

Intelligibility assessment is a hallmark of speech assessment. A reliable yet clinically-convenient method of intelligibility assessment is needed for both clinical and research purposes. The current project attempts to develop an automated intelligibility assessment tool using pattern recognition, which can be eventually offered though the internet.

●Potential Partners

High-tech industry with emphasis on medical engineering, speech recognition/synthesis, and assistive technology