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INTRODUCTION

These *Perspectives* (SIG 19) articles provide with information relevant to speech science research and education. Lulich and Pearson present two demonstrations in this technical report to illustrate the utility of 3D/4D ultrasound technology. First, the authors report that "not only can structures be imaged which previously were impossible to identify from 2D ultrasound alone (e.g., piriform sinuses and posterior pharyngeal wall), but questions involving non-sagittal structures and asymmetrical tongue shapes, such as the pervasiveness and extensiveness of lateral contact between the tongue and the palate-teeth, can now be addressed non-invasively." Second, they also conclude that "the fusion of ultrasound data with MRI images further enhances the utility of 3D/4D ultrasound, since it combines the strengths of ultrasound with the complementary strengths of the other modality, while mitigating the weaknesses of each." Richardson et al., compare various acoustical measures of sustained vowels obtained using the Multidimensional Voice Program (MDVP) by Computerized Speech Lab, Praat, and TF32. Results show that the MDVP yield significantly higher values of standard deviation of fundamental frequency, jitter, and shimmer, and significantly lower values of noise-to-harmonics ratio compared to the other programs. They discuss the variation of numerical values across programs and the resulting clinical implications. Hagedorn et al. discuss the benefits of a collaboration among engineers, speech scientists, and clinicians which yield "the development of biologically inspired technology that has been proven useful for both small- and large-scale analysis," a better understanding of speech production, and the development of assessment tools with a clinical benefit and interdisciplinary reach. They also review the use of real-time magnetic resonance imaging across clinical populations and discuss the challenges associated with collaborative work. Lee and Fischer reveal an association between acoustic vowel space and the severity of dysarthria. They review sex differences, factors that may affect formant-related measures, and clinical implications.

LEARNING OUTCOMES

You will be able to:
- describe how 3D/4D ultrasound can contribute to speech research
- identify the potential benefits and limitations of using an acoustic analysis software program as a tool in instrumental voice assessment
- describe the ways in which acoustic and kinematic speech research modalities have evolved through the years
- explain how to visualize a single word-based acoustic vowel space with the tutorial

PROGRAM HISTORY

Start date: November 25, 2019
Available through: November 23, 2022

IMPORTANT INFORMATION

To earn continuing education credit,
you must complete the test with
a passing score on or before
November 23, 2022.

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