



Vocology: Past, Present, and Future

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I. Introduction

Speech and oral communication identify humans as unique in the animal kingdom. The specialized vocal tract enables production of complex acoustic signals that may be produced as song, oration, and speech. The study and celebration of voice production is multifaceted, as the voice is facilitatory to identity, spirituality, community, culture, and emotions. While representative of these areas and more, voice production is a physiological nonlinear interaction between three subsystems: respiration, phonation, and resonance. Early explorations of the voice included historical summaries dated to 1600 BC on Egyptian papyrus, medical speculations by Hippocrates, and Aristotle's contributions on scientific basis of voice and the emotion connection.¹ These initial inquiries on the science of the voice precede the foci on vocology, its current utilization in practice, and visions for future work. This paper will offer an overview of the timeline of vocology through past and present collaborations, as well as projecting future directions that highlight the unique place that voice science occupies across disciplines.

II. Vocology – Early Practices

Vocology is the science and practice of voice habilitation.² It is an interdisciplinary subject that encompasses voice science and voice health. Vocology has been recognized as a discipline for only three decades, but it is rooted in centuries of voice science and voice pedagogy. Although the etymology of the term “vocology” dates only to 1989, the principles of the field date back hundreds of years. Its origins can be traced to the earliest collaborations between scientists, singers, physicians, and pedagogues.

In the 1800s, angled mirrors and reflectors were designed to view the larynx by candlelight. The earliest laryngeal visualizations via bent and angled mirrors were recorded in 1749, 1823, and 1854.³ Voice teacher Manuel García II, who is recognized as the principal developer of the modern-day laryngoscope, documented laryngeal observation in 1854. The collaboration between science and art in vocology is vividly portrayed in the profound curiosity of García, who was interested in the physiology of the voice, not merely vocal/acoustical acrobatics.

The work of García is an example of the collaborative research that characterizes vocology. There are myriad interdisciplinary relationships that advanced the understanding of the voice, particularly for habilitative purposes. Nascent development of videostroboscopy occurred when health care providers worked with opera singers on vocal habilitation. Otolaryngologist Hans Victor von Leden, who was the chair of neck surgery at Northwestern

University, was an avid supporter of the Lyric Opera of Chicago. He collaborated with G. Paul Moore, senior speech-language pathologist at Northwestern University, to form the interdisciplinary Institute of Laryngology and Voice Disorders.⁴ Their work produced ultra-high-speed photography images and the first film of the vocal folds with synchronized action and sound in 1956. The vibratory capabilities of the vocal folds via the body-cover theory (1974) was researched and documented by Minoru Hirano, a post-doctoral fellow working under von Leden.

Around this same time, voice pedagogues began to incorporate voice science into singing instruction. William Vennard, author of *Singing: The Mechanism and the Technic* and D. Ralph Appelman, author of *The Science of Vocal Pedagogy: Theory and Application* made significant contributions to pedagogic literature with these influential textbooks.⁵ Other advocates for the convergence of the science and the art of the voice include Van Lawrence, an otolaryngologist who fostered interdisciplinary education among laryngologists and singing teachers. The Voice Foundation was founded by William James Gould in 1969; this organization promotes interdisciplinary work between physicians, scientists, speech-language pathologists, performers, and teachers to share their knowledge and expertise in the care of the professional voice user. An annual conference maintains this interdisciplinary collaboration and their flagship publication, the *Journal of Voice*, publishes research on the voice. In 1987, Johan Sundberg elucidated the role of acoustics in the field of voice science with the textbook *The Science of the Singing Voice*.⁶

The discipline of vocology was an outgrowth of these and other collaborations between voice professionals across a range of fields. Although the first public presentation of the term vocology was by otolaryngologist George Gates,⁷ it was defined and disseminated by voice scientist Ingo Titze in an article in the *NATS Journal*.⁸ Titze, who is a voice scientist and executive director of the National Center for Voice and Speech, co-authored the textbook *Vocology: The Science and Practice of Voice Habilitation* with Katherine Verdolini-Abbott, professor of communication science and disorders at the University of Delaware.

In 2013, a symposium hosted by the National Center for Voice and Speech produced a proposal to create the Pan American Vocology Association (PAVA), an professional organization devoted to the new field of vocology. Five years later, the organization introduced the standards for “recognized vocologist (RV),” and in June 2022, the application process and requirements were finalized.

III. Current Vocology Implementation

Vocology fosters multidisciplinary collaboration in research, as well as interdisciplinary research due to the budding interest in collaboration between those in the areas of pedagogy, voice science, and performance. Convergence research in the field of vocology permits investigation of the challenges that exist at the interfaces of these multiple, related fields. Through integration of



diverse areas of expertise through collaborative partnerships, convergence research stimulates innovation from basic science to translational application.⁹ These partnerships foster the emerging area of evidence-based pedagogy.

With inclusion of the field of speech-language pathology, clinical medicine uses research to inform treatment of voice disorders and rehabilitation of the voice. This research translates from the basic science bench to clinical application and is called evidence-based practice. However, the effective translation of research into current teaching and learning in the voice studio is less secure.

The current pedagogic experience and education for those in the United States varies widely depending on the genre of singing such as classical, musical theater, or contemporary commercial music. Some music programs already include a comprehensive pedagogic education, which prepares students for a future in both performance and teaching; however, other programs lack a pedagogic component. The addition of a comprehensive education in vocology either concurrent with traditional education, or outside of the typical box, allows for application in the studio, on the stage, or in the clinic. Vocologists therefore support aspiring pedagogues and performers, or clinicians, and foster convergence research through interdisciplinary collaboration.

As highlighted in the standards to become a recognized vocologist that were recently established by PAVA, the vast field of vocology includes many areas of study: voice physiology, anatomy, and biomechanics, breathing and aerodynamics, laryngeal changes through the lifespan, basic acoustics, instrumentation for voice analysis, psychoacoustics, phonetics, voice training and habilitation, amplified singing in contemporary styles, bodywork, choral and ensemble voice, skill acquisition and perceptual motor learning, unamplified singing in classical styles, voice for the actor, transgender voice, and voice disorders and rehabilitation.¹⁰ The potential for collaborative research and application is limitless in vocology. The application for PAVA-RV is tripartite and consists of an exam, a multidisciplinary portfolio, and continued demonstration of competency and involvement in PAVA, which is monitored every three years. Fostering evidence-based pedagogy and convergence research is a goal for the organization; applicants are required to demonstrate knowledge, experience, and expertise in three other vocology fields using this profile. A caveat of the application is that no applicant has the authority to practice outside their own established professional practice. This statement is important in a discipline that crosses boundaries and creates additional gray areas across habilitation and rehabilitation.

The PAVA-RV certification certainly offers a professional distinction, which can enhance a career. Lamar University's vocology certificate, which is currently the only available online program, affords students international access. The curriculum includes speech anatomy and physiology, speech and voice science, pedagogy of performance, literature of vocology, instrumental analysis of voice, auditory perceptual training, speaking voice habilitation, and

singing voice habilitation, all through the lens of vocology.¹¹ The establishment of this comprehensive curriculum raises the possibility of creating a degree program in vocology. The path toward such a program is greater interdisciplinary mentorship and connecting those experts in various facets of vocology.

IV. Current Vocology Limitations

Current challenges include the awareness of voice science fields in general. Many professional voice users are unaware of voice specializations within the field of speech pathology and the field of vocology in general. Another challenge to navigate is the allotment for convergence and collaboration but recognition of discipline boundaries, particularly working with those who require rehabilitation of the performing voice. The last challenge is establishing international recognition in the academic setting for additional and supplementary credentials, particularly in areas outside of North America.

V. The Future of Vocology

The function and practicalities of the field of vocology in regard to licensure, certification, and training are being addressed in an ongoing manner, and the global community aims to clarify and define the role of a vocologist, as well as the discipline's contributions to the study of the voice. While these questions are multifaceted, nor easy to ask and address, the past indicates that continued marriage and shared knowledge between art and science will enhance the future of vocology. This may be via firsthand experiences as teachers and researchers, and by learning and adapting through myriad advances. Questions to ask when considering the advancement of vocology include what is yet to exist in the field, what knowledge and skills shared with students of today and tomorrow may shift our views of pedagogy, and how is the field enhanced to provide the next generation of teachers, scientists, performers, and researchers adequate tools to propel advancements?

First, collaboration between fields will contribute to a shared knowledge base by realizing the full potential of vocology. Being cross-trained in multiple disciplines and participating in interdisciplinary collaborative tasks permit new intersections to fuse and spark questions that have been previously unasked. This is the result of the collaboration of previous research that have not been connected in the past. Examples of these areas of intersection include vocal fold biology and physiology, exercise physiology of voice production, and cross-training in the vocal studio.

Secondly, the future of the field must maintain investment in student engagement. For example, mentorship and leadership in the voice studio and the research lab build confidence, competence, and proficiency in vocology. As summarized earlier, the path of vocology today would not exist without engagement cross-generationally. Active mentorship is an avenue for centering

collaboration, a defining characteristic of vocology. How can training in vocology be more accessible? What are novel ways of training?

Final questions to ponder for the enrichment of vocology in the future are centered on inclusivity, respect, and honor. While this is challenging to address, the voices, perspectives, and knowledge of people dissimilar from the norm, or perceptions of self, may be the voices for which space needs to be created. The challenging questions to ask in pedagogy, research, and genres of teaching may be, for example: whose voice is absent from the room, from a committee of voice teachers, from research and research participants? Through introspection, there is a commitment to actionable steps in the present to instill an applicability of vocology. The staunch study of the human voice, in habilitation and rehabilitation, is united with artistry, science, and research advancements.

Abigail Dueppen received her BM with academic distinction in vocal performance from the Eastman School of Music and her MM in vocal performance from the University of Houston. She is currently the Director of the graduate vocology certificate program and an instructor at Lamar University. She is also a speech-language pathologist/clinical singing voice specialist at Houston Methodist Hospital. Dueppen is pursuing her PhD in communication sciences and disorders at the University of Houston while continuing to perform on the concert and opera stage.

Maurice Goodwin is a practicing speech pathologist, voice teacher, and active performer living in Houston. Professionally he specializes in the treatment of the singing voice and voice disorders at the Texas Voice Center. Following his undergraduate studies in music performance at Shenandoah University, he completed his degree in speech-language pathology at the University of Pittsburgh and clinical fellowship at the University of Wisconsin Health Voice and Swallow Clinic. He is passionate about vocal health education and the intersections of voice and identity.

Debra Greschner is on the voice faculty at Lamar University, where she teaches voice, voice pedagogy, and vocal literature. A lyric soprano, she received undergraduate degrees in music and education from the University of Saskatchewan, and an MM from the University of Nevada, Las Vegas. Greschner is the book reviewer for *Journal of Singing* and a member of its editorial board. She is a full voting member of the Pan American Vocology Association and a founding member and faculty of the vocology certificate program at Lamar.

Teresa Procter (she/hers) is an ASHA-certified speech-language pathologist at the Texas Voice Center at Houston Methodist Hospital. She completed graduate studies in vocal performance at Rice University and in communication sciences and disorders at the University of Houston. Her clinical and musical interest in the performing voice led her to clinical fellowship training at



the Lakeshore Professional Voice Center in Metro Detroit. Teresa is the Texas program coordinator and emcee for Music for Autism and a community mentor with Momentum Education and ASHA.

¹ Diane M. Bless and Nathan. V. Welham, “A Brief History of Laryngeal Imaging: Informing Our Current Clinical Practice,” *Perspectives on Voice and Voice Disorders* 20, no. 2 (2010): 56–61.

² Ingo R. Titze and Katherine Verdolini Abbott, *Vocology: The Science and Practice of Voice Habilitation* (Salt Lake City: National Center for Voice and Speech, 2012).

³ Bless and Welham, 57.

⁴ Bless and Welham, 58.

⁵ William Vennard, *Singing: The Mechanism and the Technic* (New York: Carl Fischer, 1967); D. Ralph Appelman, *The Science of Vocal Pedagogy: Theory and Application* (Bloomington, IN: Indiana University Press, 1967).

⁶ Johan Sundberg, *The Science of the Singing Voice* (DeKalb, IL: Northern Illinois University Press, 1989).

⁷ Ingo R. Titze, “Rationale and Structure of a Curriculum in Vocology,” *Journal of Voice* 6, no. 1 (1992): 1–9.

⁸ Ingo R. Titze, “Vocology,” *NATS Journal* 46, no. 3 (1990): 21–22.

⁹ Committee on Key Challenge Areas for Convergence and Health, Board on Life Sciences, Division on Earth and Life Studies, and National Research Council, “Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering, and Beyond” (Washington, DC: National Academies Press, 2014). Summary available at <https://www.ncbi.nlm.nih.gov/books/NBK210149/> (accessed July 29, 2022).

¹⁰ https://pavavocology.org/PAVA-RV-Application_ (accessed July 29, 2022).

¹¹ <https://degree.lamar.edu/programs/vocology-certificate/> (accessed July 29, 2022).