

The background of the cover is a vibrant orange and yellow gradient. It features abstract patterns of thin, curved lines and a grid of small dots. Faint, semi-transparent images of a person's face and hands are visible, suggesting themes of communication and science. The word 'Vocology' is written in a large, black, serif font, with the 'V' being significantly larger than the rest of the word.

Vocology

The Science and Practice
of Voice Habilitation

Ingo R. Titze

Katherine Verdolini Abbott

ABOUT THE AUTHORS



Ingo R. Titze is Distinguished Professor of Speech Science and Voice at The University of Iowa and Executive

Director of the National Center for Voice and Speech at the University of Utah. His formal education is in physics and electrical engineering, but he has devoted much of his studies to vocal music and speech. He has authored *Principles of Voice Production*, *Fascinations with the Human Voice*, and *The Myoelastic Aerodynamic Theory of Phonation*. He has also appeared on educational television series, *Innovation*, *Quantum* and *Beyond 2000*. Dr. Titze is a recipient of the Jacob Javits Neuroscience Investigation Award and the American Laryngological Association Award. He is a Silver Medalist of the Acoustical Society of America, a recipient of Honors of the Association of the American Speech-Language-Hearing Association, Dr. Titze is an active singer.



Katherine Verdolini Abbott is Professor of Communication Science and Disorders and faculty member of the McGowan Institute for Regenerative Medicine at the University

of Pittsburgh, where she is also a faculty member of the Carnegie Mellon – University of Pittsburgh Center for the Neural Basis of Cognition. She completed her M.S. in Speech and Hearing Sciences in 1983 at Indiana University and her Ph.D. in Experimental Psychology at Washington University in 1991. She is a trained singer. Research interests include laryngeal wound healing, cognitive influences in voice training, and clinical trials. She is a recipient of the Honors of the Association of the American Speech-Language-Hearing Association. Dr. Verdolini Abbott is a former Editor for the *Journal of Speech, Language and Hearing Research*.

ABOUT THE BOOK

WHAT IS VOCOLOGY?

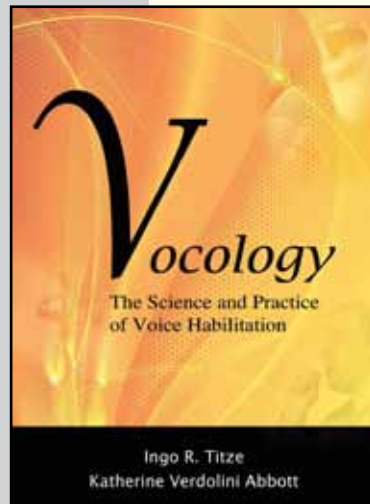
According to current knowledge, the first public reference to the word “vocology” dates to October 13, 1989 when George Gates presented a talk entitled “Coping with Dysphonia” at the Pacific Voice Conference in San Francisco. In his talk, he credited one of the authors of this book (Titze) as having recommended the adoption of the word “vocology” into our field. Titze and Gates had discussed the idea informally at a prior professional meeting. The first written recommendation to consider vocology as a field

of specialty followed three months later (Titze, 1990). A rationale for a curriculum in vocology was presented soon thereafter (Titze, 1992). The first journal to carry vocology in its title was *Logopedics Phoniatics Vocology*, formerly the *Scandinavian Journal of Logopedics and Phoniatics*. The name change occurred with Vol. 22 in 1997. The following year, the second author of this book published a *Guide to Vocology* (Verdolini, 1998), which launched the conceptualization of the current text.

In its broadest sense, vocology is the study of vocalization. This can include every aspect of human and animal sound-making in airways within the body. As a professional discipline, we give vocology a narrower focus in this book: the science and practice of voice habilitation, which includes evaluation, diagnosis, and behavioral intervention. The emphasis in this definition is on habilitation rather than rehabilitation. Restating from *Principles of Voice Production* (Titze, 1994, 2000):

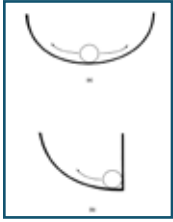
“Habilitation is the process of *enabling, equipping for, or capacitating*. Voice habilitation is therefore more than repairing a voice, or bringing it back to a normal state. It includes the process of building and strengthening the voice to meet specific needs.”

We have introduced vocology as a discipline that combines expertise from speech pathology, vocal music, theatre arts, and otolaryngology.



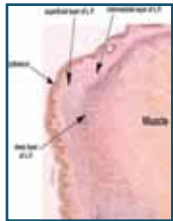
June 2012 408 pages 194 illustrations (est.) exercises
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CHAPTER BY CHAPTER SAMPLING OF CONTENT



Ch 1 What Is Vocology and How Did It Arise?

The Clientele of Vocologists
Vocal Problems as a Public Health Concern
Regimens for Voice Habilitation



Ch 2 Voice Pathology

Guidelines from the World Health Org
Incidence and Prevalence of Voice Disorders
The Biology of Vocal Fold Tissue
Lamina Propria
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Genetic Voice Pathologies
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Ch 8 Compliance and Concordance

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Severity of Health Condition
Patient Variables
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Treatment Effects
Quality of Clinician-Patient Interaction
Summary of Compliance Factors

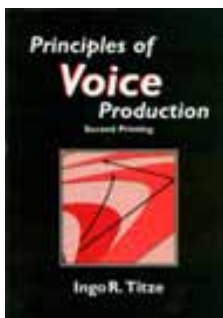
OTHER BOOKS AVAILABLE



Fascinations with the Human Voice

by Ingo R. Titze, PhD

Fascinations with the Human Voice is a book for anyone interested in voice. Teachers, choir instructors, actors, singers and public speakers can use this book to better understand their voice and how to properly use it.

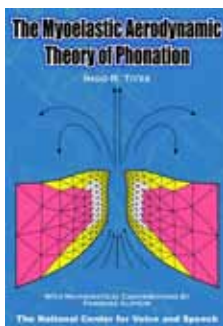


Principles of Voice Production

Ingo Titze, PhD

2nd Printing

Published in paperback by the National Center for Voice and Speech, Dr. Ingo R. Titze's text presents a set of scientific principles that apply to all aspects of voice production.



The Myoelastic Aerodynamic Theory of Phonation

by Ingo R. Titze, PhD - mathematical contributions by Fariborz Alipour

Now in print and ready for shipping... This book is written for the benefit of voice and speech scientists who use principles of physics, mathematics, and engineering to understand and simulate the mechanical processes of phonation.



Ch 9 The Union of Breathing, Valving and Voicing

An Interactive Sound Generating System
Exploring Your Lungs and Airways
The Breathing Oscillator & Valving Oscillator
Combining the Breathing and Valving Oscillators With Voicing



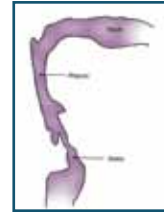
Ch 10 Using the Vocal Tract to Enhance the Sound Source

Clinical Definition of Resonant Voice
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The Effect of Vocal Tract Reactance on Self-Sustained Vocal Fold Oscillation
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Ch 12 Modulating Phonation With Articulation

The Neutral Vowel
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Modulating Phonation
w/ Articulatory Trills
Modulating Phonation
w/ Unvoiced Consonants
Modulation w/ Consonant Clusters & Tongue Twisters

POINTS OF INTEREST

- **Unique content that combines speech pathology, vocal music, theatre arts, and otolaryngology**
- **Working exercises to compliment text**
- **A summary of motor skill and acquisition and how to practice**
- **Understanding the magic behind semi-occlusion of the vocal tract**
- **Latest research and exercise and healing applied to voice**
- **How likely are clients to comply with your recommendations?**
- **Vocal fold pathologies and the effect of drugs on voice**
- **Biomechanics, physiology, and perceptual motor learning theory relevant to teachers and students of singing.**

For instrumented assessment of intonation in speech, an F_0 contour is easy to extract with computer software. A visual display of the F_0 contour is a useful feedback tool. Figure 11.6 shows F_0 contours for five short sentences of the Goldilocks story (Exercise 4 below).

EXERCISE 4

As an exercise of reiterant speech, use the syllabic repetition /ma/-/ma/-/ma/-/ma/..., to practice the first few sentences of the "Goldilocks" story.

"Once upon a time there were three bears. They lived in a house in the woods. One of the bears was Papa Bear. One was Mama Bear. And one was Baby Bear."

Use a very low pitch on "Papa Bear," a very high pitch on "Baby Bear," to increase your range of intonation:

The entire story is given in the Appendix of this chapter. We will refer to this story for other practice exercises.

The top trace in Figure 11.6 is for normal speech, the middle trace is for reiterant speech, and the bottom trace is for speech with a semi-occluded vocal tract (to be discussed below). Note the strong rise in F_0 for the expression of "baby bear" in the last sentence. Here the speaker (a male) went to 500 Hz to impersonate the baby bear.

The ultimate continuity in voicing is obtained by phonating a sentence through a thin tube or straw. This seems pointless and unnatural at first because no segmentals (vowels or consonants) are executed. However, much of the suprasegmental (prosodic) modulation can remain, as seen in the bottom trace of Figure 11.6.

EXERCISE 5

Try phonating the Goldilocks paragraph through a thin tube or straw and pay close attention to your intonation (melodic contour). Also, pay attention to how you stress syllables. You cannot do it very well by pressing your vocal folds together, so you tend to stress (or accent) with lung pressure. This is one of the great values of phonating through a flow-resistant device – it engages the respiratory system for combined stress and pitch variation. Since the Goldilocks story is a story to interest a child, you can dramatically exaggerate the pitch and stress contours.

use of lung pressure, rather than adduction of the vocal folds, for accent and stress.

Table 11.2 shows median SPL and standard deviations for the three readings (normal speech, reiterant speech, and straw phonation). Note the reduction in both mean SPL and standard deviation with the flow-resistant straw. Again, Z-scores can be computed when a large enough corpus of normative data becomes available.

Table 11.2 Median and Standard Deviation of SPL in Five Sentences of the Goldilocks Story Spoken by an Adult Male (0.3 m distance from the microphone)

Reading Passage	Mean SPL (dB)	Z-score	S.D. SPL (dB)	Z-Score
Goldilocks (normal speaking)	50		17	
Goldilocks (reiterant on /ma/)	51		17	
Goldilocks (flow-resistant straw)	36		10	

The Voice Range Profile Embedded in the Hearing Range Profile

To understand how sound is received and vocal loudness is perceived, it is useful to pair up some acoustic characteristics of the larynx with those of the ears, the major sound producing and receiving organs in the body (Figure 11.10). The larynx and the ear form a reciprocal transduction system, converting tissue movement to sound waves, and vice versa. Scientists have long recognized reciprocal relations between speech production and speech perception processes. They have called it the *speech chain* (Denes & Pinson, 1973). This chain includes all the cognitive, linguistic, neurologic, motor, biomechanic, and acoustic



Figure 11.10 Voice production and voice reception (from Titze, 2010)

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