

ifim

freiburger institut für
musikermedizin
an der hochschule für musik freiburg

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The Voice
*Insights into the Physiology of
Singing and Speaking*

Deutscher Text siehe Backcover



THIS MEDIUM

The contents of "The voice" are accessible in two ways:

- On DVD-ROM (for PC/MAC) in combination with an (external) drive. Films in four menu levels and different chapters can be chosen via a user-friendly interface.
- Via HELBLING Media App: access to the films online on two different menu levels. See page 7 for further information on installation.

CONTENTS

What actually happens inside the body when a person is speaking and singing?

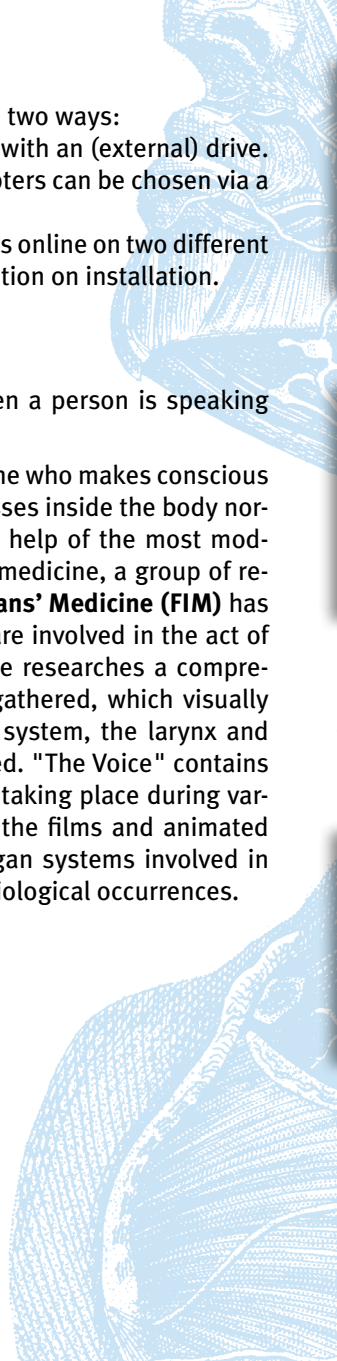
This question is of great importance for anyone who makes conscious use of his or her voice, since the vocal processes inside the body normally cannot be seen. Since 2007, with the help of the most modern investigative techniques from high-tech medicine, a group of researchers at the **Freiburg Institute of Musicians' Medicine (FIM)** has been exploring the bodily processes which are involved in the act of speaking and singing. In the course of these researches a comprehensive amount of film material has been gathered, which visually presents the movements of the respiratory system, the larynx and the vocal tract while a voice is being produced. "The Voice" contains 99 film clips with observations of processes taking place during various types of voice production. In addition, the films and animated sequences illustrate the most important organ systems involved in forming the voice and explain the basic physiological occurrences.

"The Voice" includes three chapters:

"THE VOICE ORGAN"

"TYPES OF VOICE PRODUCTION"

"EXAMINATION METHODS"





of these functional units is outlined.

In the chapter **The Voice Organ** the structure and function of the organ systems involved in the formation and development of sounds are explained and illustrated in easily understood terms, also using pictures and film sequences. In addition, the control of the complex interactions



as classical singing, folk song, belting, rock/pop and musical singing, rap, yodeling, beatboxing, and overtone singing. In addition, insights are provided into the processes of voice production during emotional statements or utterances, such as laughing, crying, and speaking while experiencing stage fright.

The chapter **Types of Voice Production** contains films made using dynamic magnetic resonance tomography, endoscopy, stroboscopy and high-speed glottography, which illustrate speaking styles (everyday talk as well as formal and stage speaking), and singing styles such



these parameters – while taking into consideration the voice timbre and the singer's or speaker's self-perception of the voice – the quality and effectiveness of a voice can be determined. Finally, easily utilized computer programs are introduced, with which a voice can be analyzed and – as in a modular system – be synthetically simulated as lifelike as possible.

The chapter **Examination Methods** demonstrates how voice production in the body's interior can be made visible. Also, measurement techniques are presented, which provide additional information about the quantitatively measurable parameters of voice production. Using

WHICH NEW INSIGHTS ARE PROVIDED IN THIS MEDIUM?

This medium is an innovative didactic aid designed to offer new insights into voice physiology. During its conception and development the authors – as professional musicians and singers, as well as specialists in musicians' medicine – set out to tackle in-depth questions related to vocal pedagogy and multi-media learning. They worked continuously in close contact with singers, speakers, vocal coaches and choir leaders, professors and students.

Visual learning, made possible using the films presented here, opens up a wide variety of new didactic approaches to the different contexts in which the voice can be used. A better knowledge of the inner workings of the body and its physiological processes leads to an enhanced understanding of individual vocal practices.

When I first saw the MRI images I was completely amazed. I had had no idea about what was awaiting me. This endless tongue, for example! I was already familiar with the general physical attributes – that was a basic part of my vocal education. I won't adapt my singing techniques to fit these video sequences. But many of the subtleties and details related to the head and throat regions were absolutely new to me.

(Michael Volle, Bariton)

With the use of MRIs – in combination with video imaging of vocal folds and supralaryngeal actions –, singers and scientists can view, in real time, complex interactions between laryngeal movement and vocal tract changes which provide an important ancillary method in singing analysis.

(Lisa Popeil, Voice Coach)



This production serves as a supplement to the books, encyclopedias and technical works already published by the authors, which deal with the topics of voice, stage fright and vocal physiology. The specialized materials, which were previously explained with words and portrayed in pictures and tables, can now be observed more vividly and comprehensibly in active sequences, using films and animated illustrations.



At the same time it is quite important to keep generalizations in a proper perspective. These films are meant primarily to make visible single, individual examples of physiological processes. Thus, experienced professional artists specializing in the styles featured were asked to contribute to the film. In principle, however, no “right” or “wrong” speaking and singing techniques can be inferred or derived from these examples. Medicine as a specialist field is in a process of continuous development. Especially in the realm of voice physiology the on-going scientific discourse is of a very complex nature and cannot be adequately represented in this production. In order to ensure that this subject area is made comprehensible to the broadest circle of persons interested in matters related to the voice we have attempted to render complicated interrelationships as simply as possible.

Although basic overall principles can be discerned in the films, no deliberate doctrines or firmly established convictions should be inferred from the particular detailed sequences.

Those interested in reading more about scientific assessments of the films can consult the specialist publications of the FIM research group listed at www.fim.mh-freiburg.de.



HOW TO USE THIS MEDIUM

These films have been conceptualized as a teaching aid. For better understanding, they are accompanied with spoken commentaries.

These spoken explanations can be individually turned off to allow users to watch the films “without commentaries”.

The films can be used interactively, without any previous medical knowledge, in speech and singing lessons, in subject-specific teaching approaches, for voice training in choirs, and for music lessons at secondary schools. It is also well-suited for self-study. This production is meant to provide specialists in the fields of music physiology and musicians' medicine with new, original insights, and the films can also be included in courses on “voice physiology” at music universities.



To derive the greatest benefits from the films we recommend that every viewer initially be offered the information provided in the chapter **Instrument Voice**. This chapter introduces and explains the structures and functions of the organs involved in producing the voice, ensuring that the best advantage will be gained from watching the films dealing with the forms of vocal expression.

The same is true for the chapter **Research Methods**. Here you learn how the films were produced, which enables you to better appreciate their qualities - and gain an understanding of possible technical limitations, for example in tone quality.

In the chapter **Forms of Vocal Expression** we recommend watching the films on various voice styles, which may not yet be quite familiar to the learner. Additional insights can be gained from observing various similarities and differences.

HELBLING MEDIA APP


The HELBLING Media App gives access to all Films for the DVD-ROM "The voice". Please use the access code next to the DVD-ROM.

Get started:

1. Download the app

Download the free HELBLING Media App to your smartphone or tablet from Apple App Store or Google Play Store.

2. Add content

Start the HELBLING Media App and tap on . Enter the access code in the field MANUAL ENTRY and confirm. The content has now been added to your app.

3. Using content

Start the Media App, tap on The voice and select the desired content from the list.

Media App content is streamed. We recommend using a WiFi connection.

ABOUT THE AUTHORS

Prof. Dr. Claudia Spahn (born 1963) studied music (recorder) and medicine and, as a habilitated physician and certified music educator, is head of the Freiburg Institute of Musicians' Medicine (FIM), together with habilitated **Prof. Dr. Bernhard Richter** (born 1962), physician and certified singer. **Prof. Dr. Mathias Echternach** (born 1973) worked as the senior physician at the FIM (2006–2018); since 2018 he is head of the Division of Phoniatics and Pediatric Audiology, Department of Otorhinolaryngology, LMU Munich. **PD Dr. Louisa Traser** (born 1984) is senior physician at the FIM since 2019 at the Freiburg University ENT Clinic and is also working as a research associate at the FIM on various projects dealing with the physiology of singing. **Dr. Michael Burdumy** (born 1983) studied electronic engineering and information technology. Since 2010 he has been a research associate in the Department of Radiology/Medical Physics at the University Clinic at Freiburg, and since 2011 research associate in the FIM, in the area of singer assessments using magnetic resonance imaging.