Voice Training Programs for Professional Speakers

Global Outcomes

Voice Training Programs for Professional Speakers

Global Outcomes

Aliaa Khidr
MD, PhD, CCC/SLP

Plural Publishing Inc.

PLURAL PUBLISHING
INC.

5521 Ruffin Road
San Diego, CA 92123

e-mail: info@pluralpublishing.com
Website: http://www.pluralpublishing.com

Typeset in 11/13 Adobe Garamond by Flanagan's Publishing Services, Inc.
Printed in the United States of America by McNaughton & Gunn, Inc.

Library of Congress Cataloging-in-Publication Data:
Names: Khidr, Aliaa, editor.
Title: Voice training programs for professional speakers : global outcomes / [edited by] Aliaa Khidr.
Description: San Diego, CA : Plural Publishing, [2017] | Includes bibliographical references and index.
Identifiers: LCCN 2017016565| ISBN 9781597569668 (alk. paper) | ISBN 1597569666 (alk. paper)
Subjects: | MESH: Voice Training | Voice Disorders--prevention & control | Voice Disorders--therapy | Cross-Cultural Comparison
Classification: LCC RF540 | NLM WV 500 | DDC 616.85/56--dc23
LC record available at https://lccn.loc.gov/2017016565

Contents

Introduction **vii**
Foreword **ix**
Contributors **xiii**

SECTION I
Practices and Outcomes of Experts From Europe

CHAPTER 1 Voice Ergonomics for Professional Speakers: Who Needs Them? Who Provides Them? What Do They Do? **3**
Leena Rantala and Eeva Sala

CHAPTER 2 Test-Theory-Training-Transfer: Voice Training in Future Radio Presenters **27**
Bernadette Timmermans and Marc De Bodt

SECTION II
Practices and Outcomes of an Expert From Africa

CHAPTER 3 Developing an In-Class Voice Education and Training Program for Prospective Speech-Language Pathologists **59**
Aliaa Khidr, Meredith Roper, and Michael Hull

SECTION III
Practices and Outcomes of an Expert From Australia

CHAPTER 4 Keeping the Voice Fit: Voice Education and Training for the Fitness Industry **99**
Anna Rumbach

SECTION IV
Practices and Outcomes of Experts From South America

CHAPTER 5 Speech-Language Pathology Services for Professional Television Broadcasters **141**
Vanessa Pedrosa

CHAPTER 6 Vocal Health Program for Teachers **173**
Fabiana Zambon, Luiz Antonio Barbagli, and Mara Behlau

CHAPTER 7 Vocal Health and Communication Training of Telemarketers in Brazil **189**
Ana Elisa Moreira-Ferreira

SECTION V
Practices and Outcomes of an Expert From North America

CHAPTER 8 Speaking From the Soul: Theatre Voice and Text Work for Clergy **237**
Kate Burke

Index **257**

Introduction

The voice carries many rich unspoken messages that are readily perceived and appreciated, such as compassion, candidacy, self-confidence, and sincerity. When these messages are an authentic reflection of the psychological state of the speaker, the listener usually perceives them as genuine and true. Some speakers are able to intentionally convey these messages to their listeners in every communicative situation, regardless of the content. These are usually the ones that get naturally selected as professional speakers.

Speakers whose voices and communication styles convey trust, authority, and motivation may find themselves equipped for political, leadership, teaching, media, or sales positions. Speakers whose voices and communication styles convey comfort and sincerity may get self-selected for spiritual positions, and so forth.

Today, in this age of professionalism, individuals no more get self-selected based on their natural vocal and/or communicative skills. They self-select a career based on their interests, the cost of education, the job market, and so on. In addition, those interested in pursuing careers that typically require professional speaking skills must keep in consideration, the need to maintain a good and robust vocal quality to ensure the communication efficiency that is inherent to the nature of their jobs.

Future professional speakers, like all professionals, rely on academic institutions to prepare them for their selected careers. These institutions are expected to provide them with the information, resources, and skills they will need to be successful in their prospective job market. Unfortunately, the core vocal and communicative skills for professional speaking that should have been intuitively targeted are not even part of most of these programs. Graduates pursuing professional speaking jobs discover, years after graduation, the effect of their inexperience in commanding their voice and caring for it. This realization may come after paying the high price of failing to meet the vocal demands of their professional career and in many cases, their social life. Such problems could have been easily prevented if voice education, training and care have been addressed early in their education, as well as throughout their careers.

Professional speakers have to look hard to find a training program that fits their individual needs by trainers and/or clinical providers who have enough experience regarding the unique vocal demands and occupational challenges of their career. Fortunately, in the past decade, many voice professionals have not only started developing specialized career-specific professional vocal and communication training programs, but also have been actively lobbying to institutionalize these programs within the workforce in their countries.

This book contains the experiences, practices, and outcomes of the work of experts from all over the world in developing, implementing, and advocating for professional

voice and communication skills education and training programs in their respective academic institutions, national associations, professional unions, service organizations, and workplaces. Our goal is to avail professional speakers, clinical practitioners, coaches, and policy makers with well-traveled road maps, evidence based programs and functional outcomes to guide our efforts in training and advocating for all the professional voices that enrich our world.

Foreword

When thinking of voice production, speech-language pathologists (SLPs) often describe voice as either being good or bad, normal or abnormal, thus limiting their attention to disability rehabilitation. This unique text reminds us that the disability view of voice production is shortsighted. In fact, there is a complete range of voice productions that should be represented on a wellness continuum where disordered/dysfunctional voice occupies only one end, and normal and superior voices comprise two thirds of the model as represented in the figure below.

Thinking in terms of a wellness continuum permits us to expand our concentration beyond voice rehabilitation, to other important areas such as how to prevent vocal problems, face vocal challenges in a healthy manner, and enhance the normal voice.

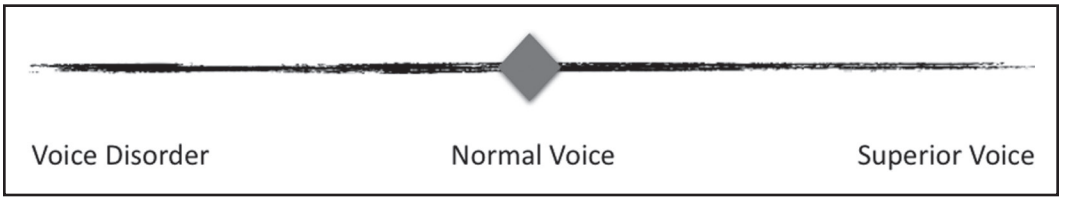
Voice Training Programs for Professional Speakers: Global Outcomes concentrates on the right two thirds of the wellness continuum, the normal to superior voice. The book provides a comprehensive discussion of the characteristics and vocal demands of professional speakers. These speakers include radio and television broadcasters, fitness professionals, teachers, telemarketers, and clergy, all individuals who, without functional voice, could not adequately perform their jobs, thus threatening employment.

Global experts from around the world share detailed education and training programs, practices, and outcomes related to educating, improving, and maintaining vocal health in this professional voice population. Most academic programs in speech-language pathology concentrate on rehabilitation of voice disorders. Core vocal and communicative skills for professional speakers are not often included in these educational programs. This book fills that gap. Each of the eight chapters provides a detailed description of a unique professional speaker population including the history of their professions, demographics, vocal challenges, and communicative demands.

In Chapter 1, the authors provide an excellent discussion on voice ergonomics of the professional speaker. While some books describe the importance of vocal health and lifestyle, this discussion includes details related to acoustic environment, air quality, posture, and specific employment-related voice demands. The chapter provides the reader with a practical guide for developing personal and environmental environments for maintaining vocal health.

Chapter 2 provides a detailed description of a training program specifically for radio broadcasters. The program involves making broadcast students aware of the characteristics of their own voices, basic vocal hygiene issues, and individual training in voice production.

Chapter 3 will be very interesting to academics responsible for teaching speech-



language pathologists (SLPs) courses in voice disorders. This chapter offers a detailed description of a voice education and training program for prospective SLPs. The authors of this chapter make the case that SLPs are professional voice users and as such, must know how to care for their own voices. This care, in turn, will make the students more aware of and sensitive to those they will eventually treat. The program includes topics such as personal vocal awareness, awareness of other voices, vocal hygiene issues, and general health education as related to voice. This chapter provided me with many ideas that will enrich the experiences of my own students in the graduate voice disorders class.

Chapter 4 is a detailed description of a specific voice education and training program for a group of professionals who often seek treatment in voice centers, fitness trainers. Speaking and shouting instructions while being physically active is a challenge. This educational program includes topics regarding the components of voice production, tips for keeping the voice healthy, signs and symptoms of voice problems, and should voice problems occur, where to seek help. Three delivery models are described including group seminars and workshops, small group practical sessions, and individualized training.

Chapter 5 discusses the challenges of professional television broadcasters, specifically television and Internet journalists, television hosts, and sports journalists. Beyond a clear, pleasing, and healthy voice, the authors explain that the good media professional must know how to use language to express his or her ideas, and how to synthesize and use the aspects of expressiveness of communication through voice, articulation, rate, prosody, breathing, posture, and facial expressions to communicate on video a sense of spontaneity and naturalness. The chapter precisely describes how SLPs may help broadcasters to attain these goals.

Chapters 6 and 7 provide detailed vocal health education and training sessions for two professionals who historically are presented with vocal challenges, teachers and telemarketers. Discussions for both professions include demographics, history of SLP involvement in vocal health training, and specific outlines of programs involving vocal ergonomics, health promotions, specific prevention recommendations, and communicative competence training.

Perhaps one of my favorite chapters, Chapter 8 describes the importance of "theater voice" and "text work" training for clergy. The following is a quote from the author:

> Aspiring clergy who have not been nourished with the meat-and-potatoes practical tools that are needed to speak from the soul, who have only been served bread-and-water public speaking techniques, or pie-in-the-sky homiletics training, can take heart.

Indeed, the quote left me hungry for more. And this chapter provides much more in a detailed description of the theater training methods used to permit this population to "speak from the soul."

In short, this book is unique. It fills that giant void where training to improve disor-

dered voice leaves off, often at the expense of enhancing, improving, and maintaining the health of the normal voice. These authors have succeeded in encouraging this voice therapist to open his mind to a more "global" view of voice care. Enjoy!

—Joseph C. Stemple, PhD, CCC-SLP, ASHAF-H
Professor
Division of Communication Sciences and Disorders
Department of Rehabilitation Sciences
College of Health Sciences
University of Kentucky
Lexington, Kentucky

Contributors

Luiz Antonio Barbagli, BS
President, São Paulo Teachers Union
SinproSP
São Paulo, Brazil
Chapter 6

Mara Behlau, PhD, SLP
Director of Centro de Estudos da Voz, CEV
Permanent Professor of the Human Communication Graduate Program
Universidade Federal de São Paulo, UNIFESP
São Paulo, Brazil
Chapter 6

Mary K. (Kate) Burke, MFA
Head of Voice and Text Training
Associate Professor, Department of Drama
University of Virginia Master of Fine Arts Actor Training Program
Charlottesville, Virginia
Chapter 8

Marc De Bodt, MA, PhD
Visiting Professor, Ghent University
Director, University Rehabilitation Center for Communication Disorders
Antwerp University Hospital
Edegem, Belgium
Chapter 2

Ana Elisa Moreira-Ferreira, MD, SLP
Speech Pathologist, Communication Coach, Consultant in Human Communication
Executive Director at UNIVOZ
São Paulo, Brazil
Chapter 7

Michael Hull, PhD
Instructor, Educational Research, Statistics, and Program Evaluation
Department of Education Leadership, Foundations, and Policy
University of Virginia, Curry School of Education
Charlottesville, Virginia
Chapter 3

Aliaa Khidr, MD, PhD, CCC/SLP
Professor of Phoniatrics
Unit of Phoniatrics, Department of Otolaryngology, School of Medicine
Ain Shams University, Cairo, Egypt
Department of Communication Disorders
Curry School of Education (Retired)
University of Virginia, Charlottesville, USA
Chapter 3

Vanessa Pedrosa, PhD, SLP
Speech Pathologist, Communication Coach
Executive Director at Fonoevidence
Consultants in Human Communication
São Paulo, Brazil
Chapter 5

Leena Rantala, PhD
Senior Lecturer in Speech Language Pathology

Faculty of Social Sciences
University of Tampere
Tampere, Finland
Chapter 1

Meredith Roper, BSEd
MEd Speech-Language Pathology Candidate
Associate Clinician
Sheila C. Johnson Center for Human Services
University of Virginia
Charlottesville, Virginia
Chapter 3

Anna Rumbach, BSc, MSpPathSt, GCHEd, PhD
Lecturer in Speech Pathology
School of Health and Rehabilitation Sciences
The University of Queensland
St. Lucia, Brisbane, Australia
Chapter 4

Eeva Sala, MD, PhD
Docent in Phoniatrics
University of Turku
Secretary of the Finnish Voice Ergonomic Society
Turku, Finland
Chapter 1

Bernadette Timmermans, MA, PhD
Professor, SLP – Voice Coach
Docent, Royal Institute of Theatre, Screen and Sound
Erasmus University
Professor of the Free University of Brussels
Consultant VRT, Medialaan
Brussels, Belgium
Chapter 2

Fabiana Zambon, PhD, SLP
Teacher's Vocal Health Program Coordinator,
São Paulo Teachers Union, SinproSP
Professor, Centro de Estudos da Voz, CEV
São Paulo, Brazil
Chapter 6

I dedicate this book to

My father, Ali Khadr, for his amazing capacity to love, for always believing in me, and for showing me that teaching is a lifelong relationship that grows way beyond the classroom walls.

My mother, Alia Abdel Moty, for taking so much pride in her teaching skills, for boasting about her students' command of the subjects she teaches, and for planting in me the seeds of enthusiasm for developing engaging educational activities.

My mentor, Nasser Kotby, for fighting for what he believes in, for enjoying every small gift in life, and most importantly for making me realize that "Academia" is a big family of international best friends who have fun working together toward changing the world.

My husband, Emaad Abdel Rahman, for being my home, my beloved and my best friend, and for showing me every day what does it really mean to live in the presence of GOD.

My daughter, Rana, the peacemaker, and my son, Ali, the debater, for being my radiant sun and reflective moon.

All my loving family and friends, for keeping my heart warm.

For all my talented students, clients, and colleagues, for keeping me motivated to do more.

SECTION I

Practices and Outcomes of Experts From Europe

CHAPTER 1

Voice Ergonomics for Professional Speakers: Who Needs Them? Who Provides Them? What Do They Do?

Leena Rantala and Eeva Sala

Basic Concepts

Clear and well-functioning voice is part of the professional skills and ability to work. Voice should be under the control of a voice user so that he or she knows the possibilities and restrictions of the voice as well as the risks that may threaten it. Environment where voice is used should be conducive for that purpose. Noise and poor acoustics should not disturb those who are producing voice or listening to it.

Speech (voice) is the most important tool in communication between humans. Voice source is in the larynx that changes aerodynamic energy generated by exhalation into acoustic energy. Acoustic energy is worked up and amplified in the supraglottic tract into words and sentences. Voice propagates through air as the mechanical waves of pressure and meets the ear where it changes into mechanic and electroacoustic energy. A neural tract starting from the inner ear transfers signals to the brain for interpretation and understanding.

Voice ergonomics has been developed for improving voice and speech as a communication tool. It addresses all the measures that increase possibilities to good voice and speech production and their hearing (perception). Voice ergonomics contains personal and environmental factors. Its purpose is to make personal ergonomic measures such as taking care of the health of the voice organs and adopting less loading (loading-free) activities/working practices. It also contains environmental ergonomic measures such as observing and treating noise sources and acoustics, working/activity postures, and indoor air quality proper for voice and speech production. When voice ergonomics is taken more extensively, there also includes reduction of noise that is important for cognitive functions of listeners such as attention and memory. This chapter will cover voice ergonomics, its background, risks, and problems and solutions.

Voice disorder is a state in which voice does not function according to the needs of a speaker or in which voice quality is considered not proper/adequate for the purpose. Speakers often suffer from various symptoms related to voice use and/or injury of the voice organs. Voice disorder is a complex entity and has several levels to explore.

There are several risk factors behind a voice disorder, and they often occur at the same time. When vocal load increases over a

tolerance, symptoms caused by voice dysfunction and/or voice organs appear. Vice versa when risk factors are picked up and deleted, voice function returns to its original or to a better functional state at least. Risk factors for a voice disorder can be found from issues related to person and from those related to the environment.

Box 1–1

Risk factors for a voice disorder can be found from issues related to a person and from those related to the environment.

Personal factors include

- the health of the voice organs,
- voice use skills and practices,
- personality,
- lifestyle,
- leisure time activities, and
- voice demands at work.

Environmental factors are

- noise and acoustic conditions,
- indoor air quality,
- possibilities to use good working postures, and
- access to aids (loudspeakers), if necessary.

When voice does not function according to a user's needs it may lead to the avoidance of voice use, to the selection of practices or work tasks with less/no voice demands, to the decrease of ability to be active or work, to the drop of outcomes, to be unable to work, and absence/absenteeism from work. At worst, a worker may even have to change his or her work and educate himself or herself to a new profession.

It is possible to prevent a voice disorder to a certain level at least. Ways to do this are to acquire good/excellent skills in voice production, to take care of the health of the vocal organs, to adopt light loading activity/working practices, and to keep good postures. To keep the voice production in a good state, voice exercises are recommended as a daily regular habit.

To treat a voice disorder successfully, underlying causes need to be examined carefully because the treatment is not the same for all voice disorders and a serious underlying condition may be present. There are several kinds of voice disorders: functional, organic, and neurologic. A physician (voice specialist) has the responsibility to assess and define (diagnose) a voice disorder, to explore a voice disorder type, and offer and outline the treatment.

The treatment of a voice usually contains the remedy of a disease, the elimination or decrement of risk and loading factors, checking the voice production manner, and if necessary correcting it.

Prevention of a voice disorder is based on the knowledge of the physiology of voice production and risk factors. Personal and environment risk factors are checked and deleted or decreased as effectively as possible. In addition, voice ergonomic information is given and exercises for health and economic voice use habits are taught.

Voice Ergonomics

The Development of Voice Ergonomics

The first research concerning occupational voice disorders was published in Germany in 1970; this was a monograph by Gunderman (1970). Fifteen years later a Finnish phoniatrician Erkki Vilkman started systematically to connect voice and environmental factors (Vilkman & Manninen, 1986). At the same time in Sweden Ann-Christine Ohlsson (1987) got interested in the same issues for her

dissertation research and measured the prevalence of voice disorders among teachers (Ohlsson, Järvholm, & Löfqvist, 1987). Ohlsson also surveyed teachers' vocal behavior and created a method for measuring voice use at work (Ohlsson, Brink, & Löfqvist, 1989). After those studies, research regarding prevalence of voice disorders in occupations started to come out with increasing number in different countries, for example, in Finland (preschool teachers): Pekkarinen (Sala), Himberg, and Pentti, (1992); in Sweden (patients in phoniatric clinics): Fritzell, 1996; in Australia (teachers): Russell, Oates, and Greenwood (1998); in the United States: (teachers and other occupations) Smith, Gray, Dove, Kirchner, and Heras, (1997) and (teachers) Roy, Merrill, Thibeault, Parsa, Gray, and Smith (2004).

In addition, the number of studies assessing the consequences of voice risk factors also increased. The studies were mostly carried out in laboratory settings (e.g., Vilkman, Lauri, Alku, Sala, & Sihvo, 1997), in schools (e.g., Rantala, Vilkman, & Bloigu, 2002) or in preschools (e.g., Södersten, Granqvist, Hammarberg, & Szabo, 2002); sporadically also in other working places (in theater: Novak, Dlouha, Capkova, & Vohradnik, 1991; in call center customer service: Lehto, Alku, Bäckström, & Vilkman, 2005).

Voice ergonomics has gradually been included as part of a wide ergonomic field. The definition of ergonomics is "the theoretical and fundamental understanding of human behavior and performance in purposeful interacting sociotechnical systems, and the application of that understanding to the design of these interactions in the context of real settings" (Wilson, 2000).

The development of voice ergonomics as a part of general ergonomics has been a natural course because voice ergonomic studies have consistently shown that for workers in several occupations, voice is a main working tool and factors threatening vocal health originate from suboptimal working practices and environment.

Especially Nordic countries have been forerunners in developing and applying good voice ergonomic habits in working places. The Finnish Institute of Occupational Health (Työterveyslaitos) addressed this topic to their schooling program through which occupational health services got knowledge about the topic. Arbetsmiljöverket (Swedish Work Environment Authority) in Sweden also included voice ergonomics in their publicity program. Södersten and Lindhe (2011) wrote a scientific review on occupation-related voice disorders and voice ergonomics for Arbetsmiljöverket (Swedish Work Environment Authority). Arbetsmiljöverket (Swedish Work Environment Authority) also put information about voice and a simplified screening form of voice ergonomics in a working place on their web pages (retrieved December 5, 2016, from https://www.av.se/globalassets/filer/checklistor/rostergonomi-checklista.pdf).

Several articles in international publications are available. Of two books available, one concerning voice ergonomic risk factors in working places has been published in Finnish and Swedish. The book was written for the use of occupational and professional voice users and also for occupational health service personnel (Sala, Sihvo, & Laine, 2005, 2011). It has been used also as a textbook in logopedic education. The other book (Sala et al., 2009 in Finnish, 2011 in Swedish) was written for occupational health service personnel in order to help them to observe and measure the voice ergonomic risk factors in the environment. The book also contains suggestions on how to solve problems if found.

More information is still needed in the voice ergonomic field. For instance, there is no follow-up study on how occupational health personnel consider voice ergonomics when they visit workplaces. In spite of that, our clinical experience is, however, that risk factors

found in the environment are more and more taken into account when evaluating and treating voice disorders. This means that the awareness has increased among voice experts and occupational health personnel as well as among voice users themselves.

Occupational and Professional Voice Users

There are several groups of voice users whose voice use is essential for managing their work. We differentiate those people into two groups depending on their voice skills and work situations where they use their voices.

Occupational voice users are those who need a lot of voice and often have to use loud voice in their work while speaking. They usually speak to groups and in the presence of noise. They have none or only a little guidance in voice and training for speech production. Typical occupational voice users are teachers.

Professional voice users are those who need a lot of voice in their work. They have got a lot of information concerning voice and had voice training during their studies. Typical professional voice users are actors and classical singers.

People who are also responsible for voice ergonomics are the planners of the buildings and rooms. They ought to take into account the special needs of voice users (occupational and professional voice users). The environment where voice is used should be proper for that purpose. Noise and poor acoustics should not disturb those who are producing voice and speech or listening to it. Voice users should also use proper postures while speaking. A good speech communication environment is quiet with proper acoustics, has fresh air without harmful impurities, has an environment that supports using good posture; and has aids (e.g., voice amplifiers) available, if needed.

Occupational, Professional, and Work-Related Voice Disorders

Definitions for occupational or professional voice disorders depend on the legislation of a country and terminology used in the school of the medical/scientific field.

An occupational voice disorder is often the functional correlation of a disease. In the most strict definition, occupational disease (tissue damage) is considered a disease that is most likely caused primarily by exposure at work. The exposure may be physical or chemical by nature. The definition also involves exposure in such an amount that it can cause a disease. Accordingly, occupational voice disorder is a disorder that is due to tissue damage that is most likely caused primarily by exposure at work.

A professional voice disorder is basically the same as an occupational voice disorder but lower exposure to poor ergonomic conditions may cause it.

A work-related voice disorder is due to tissue damage that is most likely caused primarily by exposure other than work, for example, tissue damage due to laryngopharyngeal reflux, which causes a disease, increases the risk for laryngitis, vocal fold cyst, polyp, pseudocyst, and so on, or if a speaker has a vocal fold paresis (viral infection or trauma). People with a work-related voice disorder mainly have symptoms at work because of the high demands of voice use needed there.

A voice disorder often causes a handicap mainly at work because of the high demands (amount and level) work sets for communication and vocal performance. The study of Sala, Laine, Simberg, Pentti, and Suonpää (2001) showed differences in vocal demands between work and free time: 38% of teachers experienced voice symptoms that complicated their communication and voice use at work, but only 4% of the same teachers reported similar problems during their leisure time.

Occupational Voice Ergonomic Risk Factors

Risk factors for voice disorders include several factors that a speaker is able to influence. Working practices in the field of voice ergonomics mean habits or practices a speaker uses while speaking. Box 1–2 presents the most typical factors threatening voice health in a workplace. There are several factors a speaker is able to regulate and influence. In many professions it is necessary to speak a lot, but to some degree this can be restricted if necessary. The same applies to some other voice use practices: using a loud voice, speaking with surrounding noise, or projecting the voice to a long distance.

Box 1–2

Working practices that may include a risk factor for an occupational voice disorder are

- speaking a lot,
- using a loud voice,
- speaking in noise,
- speaking to long distances,
- poor posture, and
- lack of aids.

Vocally harmful working practices increase voice handicap (measured with Voice Handicap Index, VHI; Rantala, Hakala, Holmqvist, & Sala, 2012) and also change acoustic features of voice in the course of a working day (Rantala, Hakala, Holmqvist, & Sala, 2015b). For instance, workers' voice levels are higher and voice quality more hypofunctional if they use voice loading practices. Several small changes in voice ergonomic factors may result in a significant improvement in the overall situation. It is often enough that a worker becomes conscious of his or her voice loading habits, and then he or she is able change them.

Working Practices

Speaking a Lot During a Working Day

In many occupations speech is the main or one of the most important working tools. Speaking is such an automatic process that speakers are usually not aware of how much they are speaking until they have voice or throat symptoms. There are differences between how much speakers tolerate speaking without symptoms. The differences can be found in the status of vocal organs, the environment, and vocal demands caused by an occupation.

There are many different methods to measure the amount of speaking during work. Teachers speak nearly twice as long as nurses during a working period. The average speaking time of teachers per work day was 40 ± 10%, and that of hospital nurses was 28 ± 12% (Sala et al., 2002). According to Durup, Shield, Dance, Sullivan, and Gomez-Agustina (2015), teachers speak around 24% of their working period, as measured with a voice dosimeter (APM, Ambulatory Phonation Monitor, Kay-Pentax APM 3200) that measures a speaker's phonation time (the time when vocal folds are vibrating—note that phonation time is not a real speaking time but is much shorter).

Although the speaking rate may seem quite small it is not experienced that way by the speaker. A recent study showed that all the teachers who participated in the research (N = 39) reported that their voice use was excessive during work (Rantala & Sala, unpublished data). This study also revealed that those teachers not being able to decrease their speaking time reported the symptom "voice does not carry" more often than those who could regulate their speaking time.

Ergonomic recommendations include that the amount of speech can be decreased and the breaks for recovery increased since even short breaks allow vocal organs recover from loading strain. Workers may benefit even from short breaks from talking, during which vocal organs can recover from loading strain (Vintturi et al., 2001a). A voice ergonomic study also showed that if a voice rest is not possible for occupational voice users (teachers) they will experience quite serious voice symptoms such as "voice gets low or voice breaks occur during speaking" (Rantala & Sala, unpublished data).

Using Loud Voice, Speaking Against Noise and/or Across Long Distance

Loud voice is necessary for listeners to hear the speaker. It is necessary to increase speech loudness (level) when speaking across a long distance and when speaking over noise. Speech loudness is also a personal feature of people: Some people talk with a quiet voice, some talk with a loud voice, and some between these extremes, even in the same circumstances.

People raise their voices when speaking in a noisy environment. This happens from 0.22 to 1 dB per 1-dB increments in noise level (Lindstrom, Waye, Södersten, McAllister, & Ternström, 2011). Values depend on the details of the method used (study arrangements, the quality of background noise, measurement distance and unit). People also react individually to noise exposure: When one increases the voice level by 1 dB as noise level increases 1 dB, others do not increase the voice level at all (Lindstrom et al., 2011).

To control the noise it is possible to agree on different ways and methods. The easiest way is to avoid noisy speaking places or decrease all unnecessary activities that cause noise. An extremely loud activity noise can be controlled, for example, by installing a noise detector. A noise detector is a device that measures the sound level. It can also be set to give an alarm by flashing LED-light when the agreed-upon noise level is exceeded. In that way people get feedback on activities that are too noisy, which they can adjust to be quieter. Technical progress brings new solutions to this need.

Speaking Across a Long Distance

Speaking across a long distance is often necessary when speaking to a group or speaking outdoors. Outdoors the sound level decreases by 6 dB when a distance is doubled, because there are not as many reflecting surfaces. Indoors the walls and the ceiling reflect sound and attenuation is less. Sound attenuation depends on the acoustic properties of the room. In a room speech sound may decrease 3 dB when the distance is doubled (room volume 200 m^3, and reverberation time 0.5–0.6 s). This means that when, for example, a teacher speaks to a student across a distance of 1 m, a normal voice level (60 dBL_{A1m}, where A is A-frequency weighting and 1 m is measurement distance) is enough, but when he or she speaks to a 4-m distance, a raised voice is needed (the voice level should be 67 dBL_{A1m}) to reach a listener at the level he or she hears the message loud enough (60 dBL_{A1m}). It is wise to decrease the speaking distance. A speaking distance can often be decreased if the situation and furniture are organized in a new way.

When speaking to a group, there are several persons speaking at the same time. This causes noise while speaking and hence the need to increase the voice. Speaking to a group also means speaking to a long distance. This, too, necessitates speaking with a louder voice. It is advisable to arrange the situation so that only one person speaks at a time and group members are near a speaker.

Speaking to a person with a hearing loss, people usually speak with a loud voice, but

hearing impaired individuals do not necessarily perceive and understand that kind of speech better. Speaking with a too loud voice makes the sound distort in the ear/hearing system because of the narrow dynamic range of hearing (narrow dynamic range means that a person does not hear quiet sounds, and loud sounds feel uncomfortable or distorted). Instead, it is best to go near to the listener, speak slower, and speak face to face so that the listener can see the lips and expressions of the speaker.

Speakers may also use a loud voice when they speak to elderly people. Elderly people have difficulties in speech identification due to their age per se and also due to presbyacusis (a hearing loss that exists in aged people). In addition, they may have difficulties in high-level speech processing. They should be spoken to in a similar manner as to people with a hearing loss: face to face, with normal voice level but slowly and with pauses. Speaking slowly with pauses is also less loading for a speaker.

Personal Factors: Working Postures

Good Speaking Posture

When speakers use good working postures, their muscles, joints, ligaments, nerves, and other body structures do not get loaded. Good postures (called also neutral or resting postures) are ergonomic and feel comfortable. Good postures allow optimal length-tension relationships between muscle groups (Arboleda & Frederick, 2008), the thoracic wall to move freely, and the larynx to situate approximately at its neutral—that is, resting—position.

The best posture for speaking is the standing position (Vintturi et al., 2001b). This permits internal abdominal organs to sink down making space for breathing movements with higher lung volume. High lung volume, in turn, lowers vertical laryngeal position caused by the tracheal pull (Iwarsson & Sundberg, 1998). The tracheal pull is the force that lowers the cricoid cartilage and,

Box 1–3

Voice ergonomic guidelines include the following:

- Be aware of the detrimental effects of noise on speech production.
- While speaking in noise, remember the right way to increase voice loudness.
- Lead and supervise situations and activities so that noise is avoided.
- Go near listeners.
- While speaking in a group, arrange so that one person is speaking at a time.
- Gather group members near the speaker.
- Avoid continuous and long-standing speaking in noise.
- Avoid speaking near equipment that emits noise.
- Keep discussions in quiet rooms.
- Choose and buy equipment that is quiet.
- Check if the noise levels of equipment can be lowered or moved to other rooms.
- Keep windows and doors closed if intrusive noise is audible and disturbing.
- Consider if a noise detector is of benefit to decrease noise.