

# The studies of teachers' voice ergonomics in Latvia: what is done and where are we going

Baiba Trinite, PhD  
Liepaja University



Valsts izglītības  
attīstības aģentūra

NACIONĀLAIS  
ATTĪSTĪBAS  
PLĀNS 2020



EIROPAS SAVIENĪBA  
Eiropas Reģionālās  
attīstības fonds

# Voice ergonomics

Voice ergonomics is awareness of work-related risk factors for voice disorders, knowledge about how to improve voice production and speech intelligibility in different work environments to prevent occupational voice disorders

*(Sodersten & Lindhe, 2007)*



Voice & Speech Research  
Laboratory  
Liepaja University  
from 2011



# Research directions

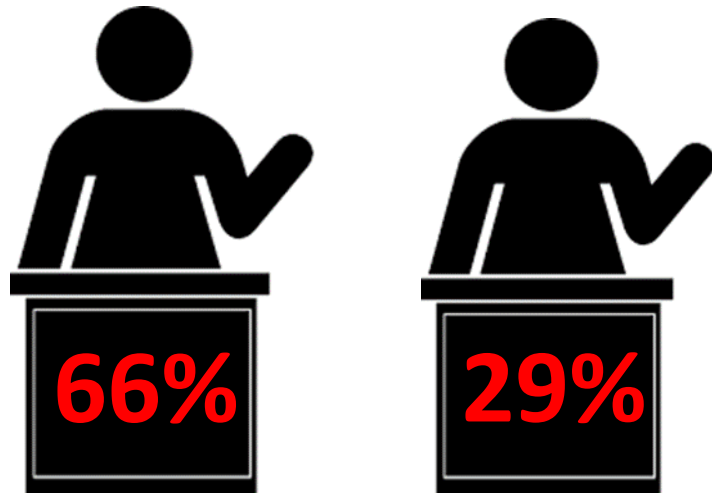
- The epidemiology of teachers' voice disorders
- Voice differences in teachers with and without voice disorders and healthcare workers
- The investigation of VHI in teachers with and without self-rated voice disorders
- The impact of voice ergonomics factors on teachers voice quality
- Voice acoustic changes in patients after thyroidectomy
- The long-term effects of sound amplification systems on teachers' vocal load (2017-2020)

## Students' projects

- Voice acoustics investigations
- The effect of voice hygiene on voice parameters
- MPT in children
- Gender differences in children voices etc.
- Occupational voice (hairstylists, actors, priests, office workers)

# The epidemiology of teachers' voice disorders

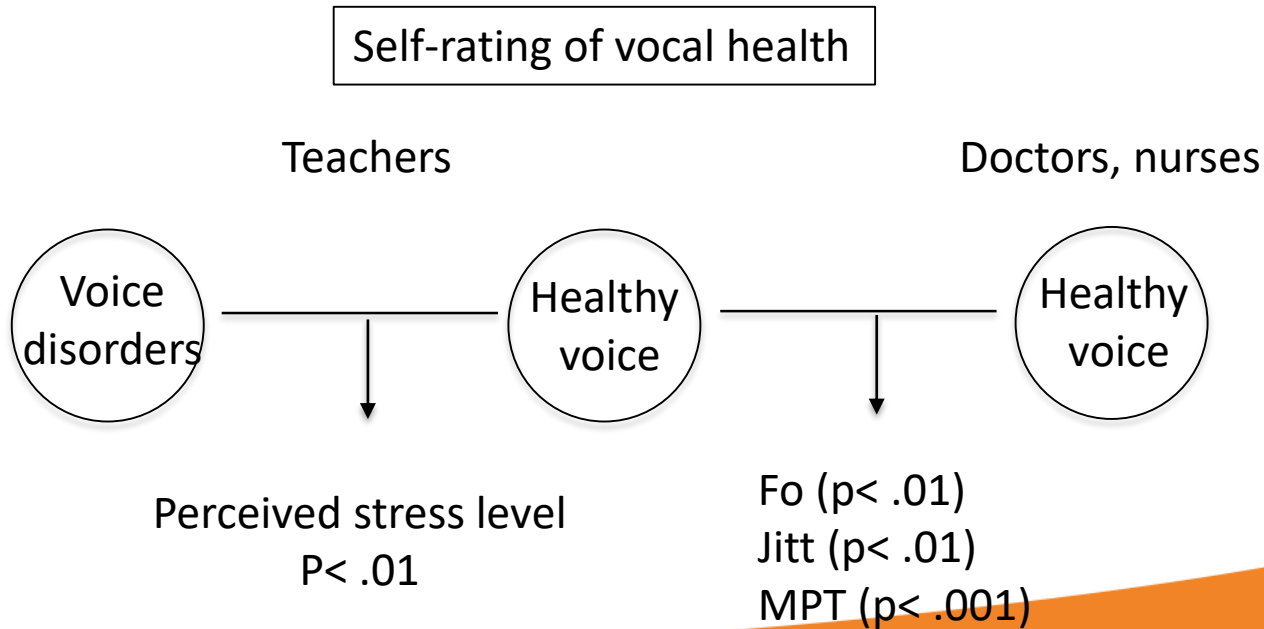
Trinite B. Epidemiology of Voice Disorders in Latvian School Teachers. J Voice , 31 (4), 508.e1 - 508.e9



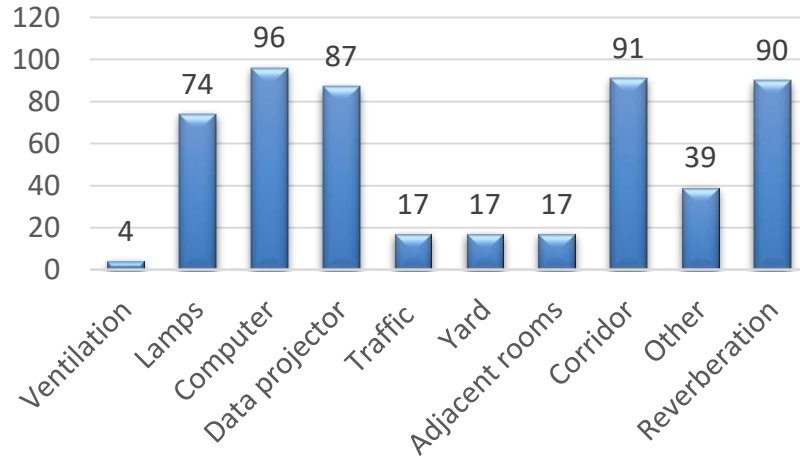
**Female. Music. Years of teaching.**

- Risk factors
  - Extra vocal load
  - Shouting
  - Throat clearing
  - Neglecting of personal health
  - Background noise
  - Illnesses of upper respiratory tract
  - Allergies
  - Stress
  - Job dissatisfaction

# Voice differences in teachers with and without self-rated voice disorders and healthcare workers



# The impact of voice ergonomics factors on teachers voice quality



AVQI & N of teaching hours  
 $r = 0.575$ ,  $p < 0.01$



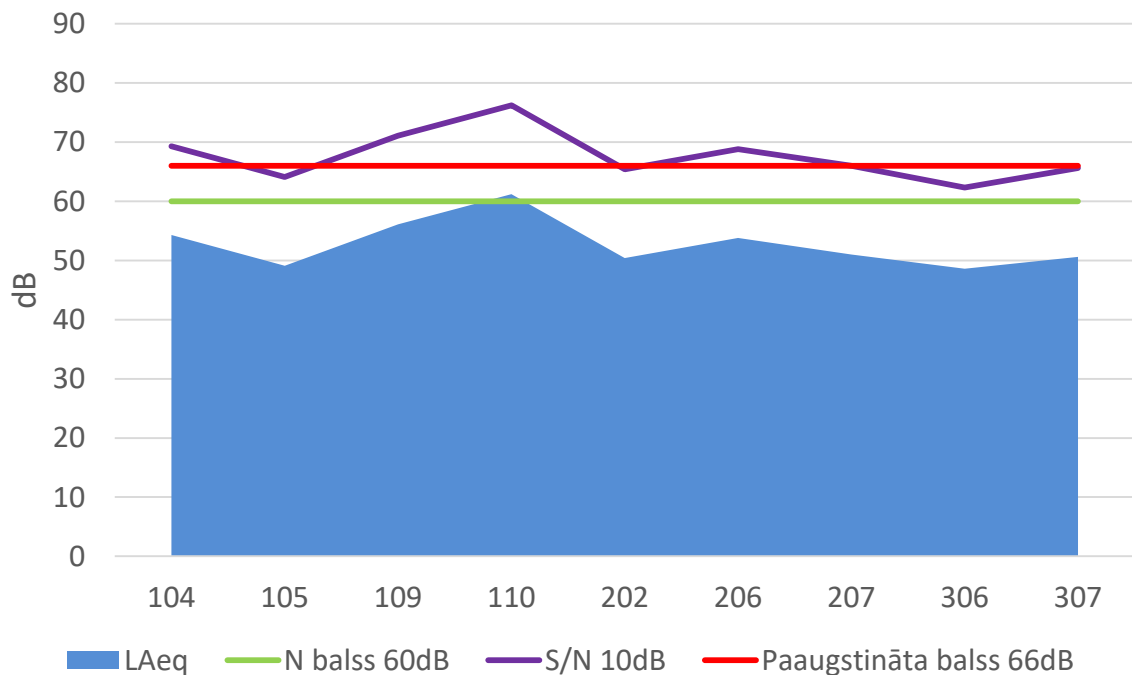
Parameter	1 M (SD)	2 M (SD)	p
$F0_{cs}$ (Hz)	195.30 (24.78)	209.14 (27.65)	<0.001
$F0_{sv}$ (Hz)	214.92 (28.92)	198.35 (52.10)	NS
SPL (dB)	61.04 (3.17)	62.46 (2.81)	NS
Jitt (%)	0.70 (0.50)	0.78 (0.56)	NS
Shim (%)	3.05 (1.00)	2.75 (1.03)	NS

# The long-term effects of sound amplification systems (SAS) on teachers' vocal load (2017-ongoing)



SAS decrease voice intensity, decrease vocal load, eliminate the main epidemiological factor. Voice improving and preserving as a result.

# I Classrooms acoustics (LAeq90, STI, RT60 (T30), etc)



Activity noise M 50.84dB (2.95)  
Voice SPL M 67.64dB (3.01)

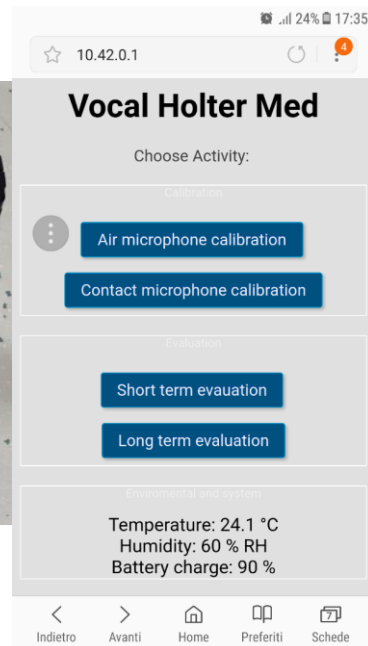
S/N ratio 15dB

## II Long-term voice monitoring

The aim: to investigate the long-term changes of voice parameters in teachers using SAS in their daily work.

(1) Does classroom acoustics impact SAS effect on teachers voice parameters?

(2) Does the effect of SAS differ in teachers with and without voice disorders?



# Conclusions:

66%

2013



2023 ?

1. The aim is to reduce the prevalence of voice disorders in teachers' population
2. We need ENTs who are interested and have time to cooperate with us
3. ENTs need a speech therapists who are interested in voice
4. The raising awareness about voice and its disorders in society is a best prevention tool



LIEPAJA - THE SUMMER CAPITAL OF LATVIA!