

Comparison of Maximum Phonation Time between Pre-School Teachers and College Lecturers

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Abstract: Professional voice users are those who directly depend on vocal communication for their livelihood. They are also considered atheistic voice users because their voice is more extensive and tough than that of non-professional voice users. Vocal fatigue is the main symptom seen in professional voice users; it is usually described as a negative sensory vocal symptom that corresponds to a change in the vocal response. Among the professional group, prevalence of voice disorder is higher among teachers who intensively used their voice at work than in other professional groups whose activities do not involve increased voice effort. Acoustic analysis of voice is one of the most appealing methods for assessing phonatory function or laryngeal disease. The maximum phonation duration is the longest time that a client can sustain a vowel sound at a comfortable pitch and loudness on a deep breath. The aim of the study was to compare maximum phonation time (MPT) in pre-school teachers and college lecturers. Using PRAAT, MPT of 20 pre-school teachers and 20 college lectures voice recorded and analyzed. Results concluded that pre-school teachers have lesser phonation time than college lecturers due to vocal abuse.

Keywords: professional voice users, vocal fatigue, vocal abuse, maximum phonation time, college lecturers, pre-school teachers

1. Introduction

The voice is a laryngeal modification of pulmonary airstream, which is further modified by the configuration of the vocal tract (Stemple, 1995). The voice is the sound produced by the vibration of the vocal folds caused by air passing through the larynx and upper respiratory tract, where the vocal folds are approximated. Expired air provides the energy required to activate the laryngeal vibrator and produce sound wave that pass through the vocal tract (resonator) [Greene & Mathieson, 1995].

“Professional voice users are those who directly depend on vocal communication for their livelihood” (Stemple, 1995). They constitute an ever-increasing segment of the population. Professional voice users are those who rely on their voice to perform their responsibilities. They are also considered atheistic voice users because their voice is more extensive and tough than that of non-professional voice users.

Vocal fatigue is the main symptom seen in professional voice users; it is usually described as a negative sensory vocal symptom that corresponds to a change in the vocal response (Satalaff, 2006). Acoustic analysis of voice is one of the most appealing methods for assessing phonatory function or laryngeal disease. The analysis of vowel sounds helps us understand the fundamental frequency, intensity, and filter characteristics.

Mahato, Regmi, Bista and Sherpa (2018) did acoustic analysis of voice in schoolteachers. The study concluded that vocal abuse, overuse, or misuse in teaching or practice over a long period can result in inadequate phonatory pattern due to vocal fold tissue damage, which ultimately results in vocal nodules or polyps.

Among the professional group, prevalence of voice disorder is higher among teachers who intensively used their voice at work than in other professional groups whose activities do not involve increased voice effort [Roy, Merrill, Thibeault, Parsa, Gray and Smith, 2004; Fritzell, 1996]. The maximum phonation duration (MPD) is the longest time that a client

can sustain a vowel sound at a comfortable pitch and loudness on a deep breath. Adult females should achieve between 15-25seconds, whereas adult males exceed this at between 25-35seconds (Williamson, 2014).

Tavares, Martins (2007) evaluated voice in teachers with or without symptoms and conclusion was that a teacher’s voice is compromised and requires more attention including control of environmental factors and associated diseases, preventive vocal hygiene, periodic laryngeal examinations, and access to adequate specialist treatment.

Christmann, Scherer, Cielo & Hoffmann (2013) investigated Maximum phonation time of future professional voice users and concludes that the future professional adult voice users with normal voice studied presented the MPT of vowels inside or below the normality, the s/z ratio normal and the é/e ratio above the normality, when compared to the group with decreased values, suggesting pneumo-phonological articulatory in coordination.

2. Method

Aim: The aim of the study was to compare maximum phonation time (MPT) in pre-school teachers and college lecturers.

Participants: 2 groups of subjects participated in the present study.

Group 1: A group of 20 pre-school teachers.

Group 2: A group of 20 college lecturers.

Inclusion & Exclusion criteria:

- The individuals were professional voice users
- Age range of participants were between 30 – 50 years
- The participants had minimum teaching experience of 5 years
- History of present or past speech, language or hearing problems excluded

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- The individuals with any neurological involvement, cardiovascular or psychological problems.

Test room condition: Recording was carried out in a well illuminated quiet room.

Procedure: Subject was made to sit comfortably on a chair in front of a laptop on which the phonation was recorded. They were instructed to phonate /a/, /i/, /u/ and hold the vowels as long as they could, after taking a maximal inhalation at their normal speaking volume. A microphone connected to the laptop was placed near the subject’s mouth while phonating the vowels. PRAAT software was used to record phonation.

Analysis: Maximum phonation time was noted by selecting the area between the voice onset times upto the voice termination time using the cursor which was displayed on the spectrogram of PRAAT software for each voice sample.

3. Result

The aim of the study was to find out whether the changes in maximum phonation time in pre-school teachers and college lecturers by checking the phonation of the sounds /a/, /i/, /u/.

Comparison of MPT of sound /a/ in pre-school teachers and lecturers

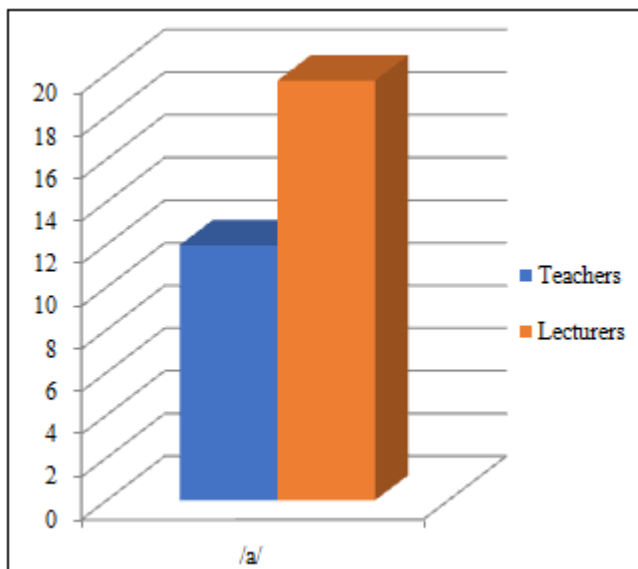


Figure 1: Figure shows the mean of maximum phonation time of /a/ sound for pre-school teachers and college lecturers

Figure 1 shows that the mean of the sound /a/ for pre-school teachers is 11.975 seconds and for college lecturers is 19.691 seconds. This shows that the pre-school teachers have lower phonation time than college lecturers.

Comparison of MPT of sound /i/ in pre-school teachers and college lecturers

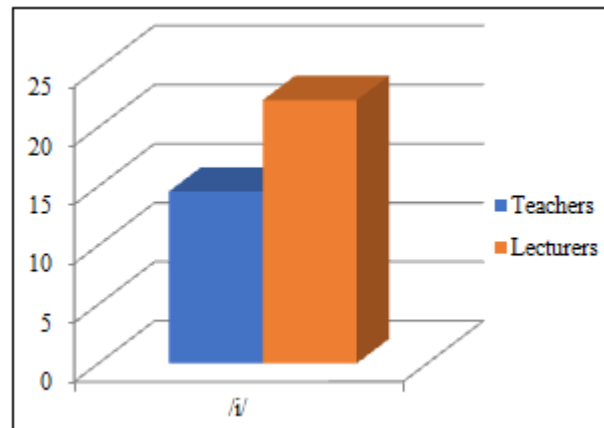


Figure 2: Figure shows mean of maximum phonation time of /i/ sound in pre-school teachers and college lecturers

The above figure shows the mean of the sound /i/ for pre-school teachers is 14.554 seconds and for the college lecturers is 22.297 seconds which is greater than the phonation time of pre-school teachers.

Comparison of MPT of sound /u/ in pre-school teachers and college lecturers

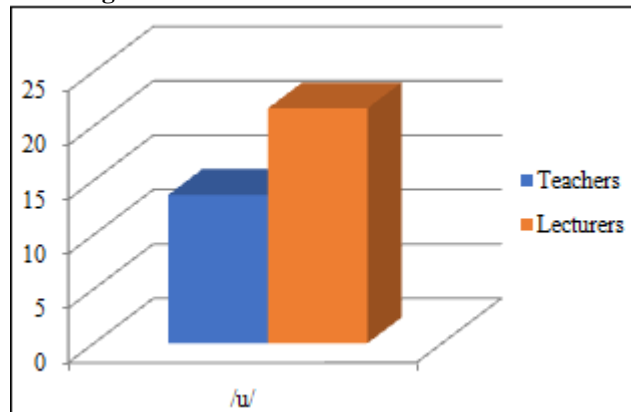


Figure 3: Figure shows the mean of maximum phonation time of sound /u/ in pre-school teachers and college lecturers

From figure 3 it is clear the mean of the sound /u/ for pre-school teachers is 13.672 seconds and for college lecturers is 21.616 seconds. This shows that phonation time of /u/ for pre-school teachers is lower than that of college lecturers.

Table 1: Shows the mean and mean difference of MPT of sounds /a/, /i/, and /u/ in pre-school teachers and college lecturers.

Sounds	Pre-School Teachers	College Lecturers	Mean Difference
/a/	11.9755	19.691	7.716
/i/	14.5545	22.297	7.743
/u/	13.672	21.6165	7.944

Table 1 shows the mean and mean difference of MPT of sounds /a/, /i/, /u/ in pre-school teachers and college lecturers, where the mean of sound /a/ in pre-school teachers is 7.716 seconds lesser than college lecturers, similarly for sound /i/ it is 7.743 seconds lower than college lecturers and for /u/ sound the mean is 7.944 seconds lesser than college lecturers. Hence it is found that the mean of MPT of all the sounds /a/ /i/ /u/ is much greater in college lecturers than in pre-school teachers.

4. Conclusion

Voice is a potent, effective and artistic tool for communication. The voice can convey not only sophisticated scholarly concepts, but also fine emotional nuances voice is the primary instrument through which an individual personality is projected compatriots are influenced (Sataloff, 2006).

Vocal misuse and abuse were predominant causative factor for voice problems in vocation involving high demands on vocal mechanism, alone or in combination with biologic and psychosomatic factors, which may result in chronic or acute symptoms of vocal attrition such as vocal fatigue, hoarseness, throat discomfort or pain and benign mucosal lesions (Sapir, 1993).

Voice issues are more common in professional voice users such as lecturers, pre-school teachers etc. Since both pre-school teachers and college lecturers are professional voice users, they use their voice for livelihood, which can cause vocal abuse. As a result, the current study concludes that pre-school teachers have lesser phonation time than college lecturers due to vocal abuse. This is because, pre-school teachers mainly interact with children, henceforth, would require more effort and strain while dealing with them. This makes them use their voice in a very unhealthy way. Whereas college lecturers are dealing with much more elder children so that they don't have to take more effort comparing to pre-school teachers.

The aim of the present study was to find out the comparison of maximum phonation time between pre-school teachers and college lecturers. From the above result, it can be concluded that pre-school teachers have lower MPT than college lecturers.

5. Limitations

- The sample size has been limited
- Only professionals with at least 5 years of experience have been considered.

6. Further Recommendations

This parameter can be studied on different professionals such as receptionist, telephone operators, bus conductors, lawyers, radio jockeys etc., recommended for future study.

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