NORMAL PHONATION DURATION

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Introduction

Phonation is a complex activity. Voice is very versatile. Phonation duration varies among individuals. Phonation duration depends on the amount of air available on exhalation and many other factors. Some of the variables that effect phonation duration are :

1. the frequency of the phonation;
2. the SPL of phonation;
3. the vowel being phonated;
4. the general physical condition of the individual; and
5. the amount of kind of training the individual has had, i.e., athlets generally do better than non-singers (Lass and Michel, 1969).

Literature available on the duration of phonation is scanty.

Apparently in many voice-disordered subjects the phonation duration seems to be affected. It is also apparently affected in some cases of.stuttering, dysarthria and/or dysarthrophonia.

Maximum duration of phonation is defined as the maximum amount of time an individual can sustain phonation after taking a maximum inhalation (Michel and Wendhal 1971).

Ptacek and Sanders, (1963) appear to be the first to suggest that the maximum phonation duration may be influenced by the frequency and SPL of phonation. Then results indicated that males could sustain phonation longer than females, especially at lower frequency and SPL. Then, as both frequency and SPL increased the phonation times between the males and females tended to become more similar. However, a considerable degree of variability among subjects was still evident in that significant differences existed for frequency, SPL interaction was significant for the males but not for females.

Lass and Michel (1969), report that for low frequency phonations of both males and females and for the moderate frequency phonations of the males there

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was a general tendency for phonation time to increase as **a** function of SPL**.** In high frequency phonations for both males and females, there was a decided tendency for phonation duration to decrease as SPL increased.

Van Riper (1954), states that an individual should be able to sustain phonation for at least 15 seconds.

Fairbanks (1960) states that 20 to 24 seconds is normal for sustaining a phonation. So far as could be determined, these figures are based on clinical observations.

The short phonation times are associated with laryngeal pathology and can be improved by treatment was shown by Von Leden et al., (1967), who reported an increase in phonation time from 1.33 to 14.79 seconds in one case and from 3.91 to 8.66 seconds in another case. (Both of whom had unilateral vocal fold paralysis) after injecting teflon paste into the affected folds.

Michel *et al.,* (1968), aslo demonstrated an increase of from 4 to more than 20 seconds maximum phonation time as a result of teflon treatment of unilateral vocal folds paralysis.

Maximum duration of phonation has been used as diagnostic tool for some time. Arnold (1959) reports that in case of paralytic dysphonia, phonation time is always shortened to 3 to 7 seconds. He goes on to state that ' similar findings were made[1] in 1942 by Rieben (5 seconds), in 1937 by Luschinger (3 to 15 seconds), and in 1952 by Brahm (3 to 12 seconds)'.

The rationale for this measure has been alluded to by Arnold (1959), who wrote that ' this simple test gives information of the efficiency of the pneumophonic sound generation in the larynx'. He further states that' it also demonstrates the general state of the patients' respiratory co-ordination.' Norms for phonation duration are not available for the Indian population. In this study, it has been tried to establish norms preliminarily for adults.

Methodology

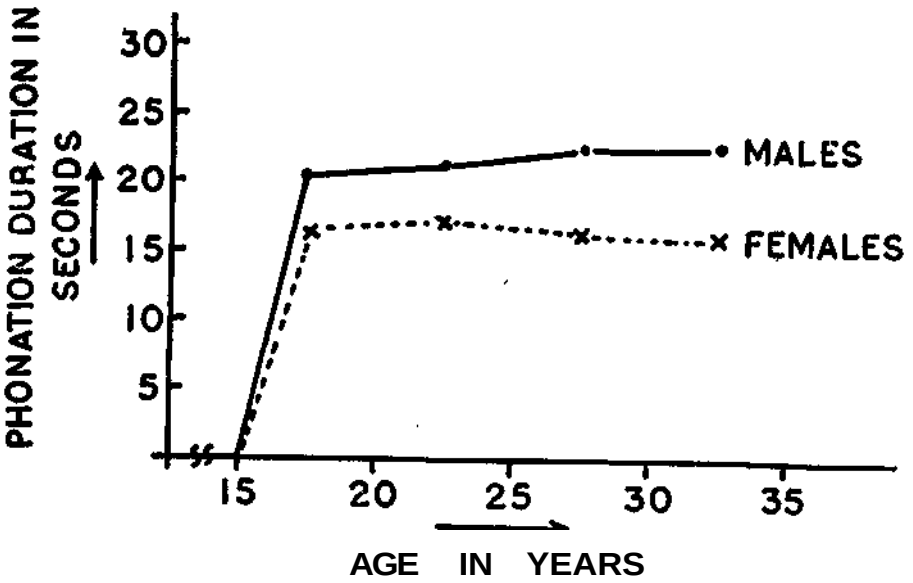
One hundred seventy seven normal adult subjects were tested. Subjects' age range was 15 to 34 years. There were 95 male and 82 female subjects. The subjects were free from voice and speech disorders and other upper respiratory infections.

Each subject was instructed to take a deep breath and phonate the vowel /a/. They were also instructed not to change the pitch and loudness but sustain the voice comfortably as long as possible. The pitch and loudness were not controlled objectively in this study. Each subject had one trial and was instructed again if necessary. Subjects were asked to phonate 3 times and the average duration was taken. A stop-watch (Racer) was made use of to note the time of phonation druation.

Phonation duration of some voice cases and stutterers were also taken from the case-histories to be compared.

Findings

The average phonation duration of males and females of different age groups are given below. The results are also represented graphically.



Phonation duration in seconds

Age Range	Males	Females
15-19 Years	20.2 sees.	16.2 sees.
20-24 „	21.5 „	17.2 „
25-29 „	22.6 „	16.3 „
30-34 „	22.7 „	16.1 „
Total average	21.75 „	16.45 „

when the phonation duration of stuttering and voice-disordered cases are taken, it is observed that their phonation duration is considerably less than norms. Four male stutterers of age range 14.5 years to 22 years were found to have phonation duration of 7 to 15 seconds. Three male subjects of age range 16 to 30 years with hoarse voice had a phonation duration of 6 to 12 seconds. Three female subjects of age range of 14 years 8 months to 20 years with hoarse voice had phonation time of 6 seconds to 10 seconds. It was not possible to follow-up and

see if there was any change in the phonation duration of these cases after therapy. However, it seems right what Arnold (1959), says that' this simple test gives information of the efficiency of the pneumophonic sound generation in the larynx'.

Conclusion

With increase in age the phonation duration among males increases, though not quite significantly, whereas such an increase is not seen among females but a reduction is observed which is also not very significant. However, there seems to be marked difference between the norms and the cases phonation duration.

' Maximum duration of phonation has been used as a diagnostic tool for some time ' (Michel and Wendhal, 1971).

We feel that such norms for phonation duration may be established by keeping all the variables in mind and used as a diagnostic tool.

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