

Acoustic Characteristics of School Children Before and After Class Sessions

Vishnu V.K., Sreelakshmi R. and Nandhu S Mohan

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Abstract

Vocal abusive behaviors are frequently observed in school going children especially yelling and screaming. The participants of present study were 50 typical school going children attending fifth and sixth grade. Acoustic analyses were done before and after class sessions using Praat software. While comparing the acoustic parameters before and after class sessions, there were differences across parameters but was not statistically significant.

Key words: acoustic analysis, school children, vocal abuse.

Vocal Abuses, Misuses, and Voice Disorders

The mechanism for generating the human voice can be subdivided into three parts; the lungs, the vocal folds within the larynx, and the articulators. The lung (the pump) must produce adequate airflow and air pressure to vibrate vocal folds (this air pressure is the fuel of the voice). The vocal folds (vocal cords) are a vibrating valve that chops up the airflow from the lungs into audible pulses that form the laryngeal sound source. The muscles of the larynx adjust the length and tension of the vocal folds to ‘fine-tune’ pitch and tone. The articulators (the parts of the vocal tract above the larynx consisting of tongue, palate, cheek, lips, etc.) articulate and filter the sound emanating from the larynx and to some degree can interact with the laryngeal airflow to strengthen it or weaken it as a sound source.

Vocal abuse is any behavior or occurrence that strains or injures the vocal folds. This may include excessive talking, throat clearing, coughing, inhaling irritants, smoking, screaming, or yelling. Vocal misuse is improper voice usage such as speaking too loudly or at an abnormally high or low pitch. Frequent vocal abuse and misuse can damage the vocal folds and cause temporary or permanent changes in vocal function, voice quality, and possible loss of voice.

The prevalence of voice disorders in children due to abuse and misuse is more and is now an area much focused by speech pathologists. The common vocal abuse behavior exhibited by school going children are shouting, cheering and screaming, sharp glottal attack and forceful use of the voice, grunting, crying, laughing and loud or prolonged outbursts of emotion, yelling, whispering, imitation, excessive and over-enthusiastic rehearsal of school plays as well as Lengthy talking. Along with this restricted fluid intake, crowded class, dusty environment, chalk powder inhalation as well as contagious diseases.

Since vocal abuses and vocal misuses are common in school going children; the possibility of developing voice disorders is frequent. Hence, a comparison of acoustic parameters of children before and after class sessions provides a ground for planning effective vocal hygiene tips and preventing further development of voice disorders.

Approximately 4-6 out of every 100 children have a voice disorder (Deanna,2011). Of the various disorders, vocal nodule is the most commonly cited in children. By building healthy habits from the start, you can help keep your child's voice healthy. Read on to learn more about vocal nodules and how to keep your child's voice healthy. Saniga and Carlin (1992) suggested that as the child's age increased, voice usage became more conservative. Children with affective disorders such as attention deficit disorder and hyperactivity, or behaviour problems are more vulnerable to developing vocal nodules and vocal strain than others. It is rare to find just one "abusive" behaviour producing voice symptoms. Classically, children with nodules are in the habit of talking too long, too loudly and with too much effort (Smith & Grey, 1997).

Focus of This Study

The aim of the present study is to analyze and compare the acoustic characteristics of children before and after class session.

The present study aims to measure and compare the acoustic parameters of school children before and after class session

METHODOLOGY

Subjects

50 typical school going children attending fifth and sixth grade were included in the study.

Inclusion criteria

- Attending fifth and sixth grade
- Attending normal school
- Age appropriate performance in academic and non academic areas

Exclusion Criteria

- No speech and language problem
- No neurological problems
- No hearing abnormality
- No known disease or disorders

Instrumentation & Procedure

The samples were audio recorded using microphone attached to Acer aspire 4739z laptop..The recording environment was a quiet room in the school building. The subjects were seated comfortably on the chair at a distance of 1 feet from the laptop placed on the table. Each voice samples was recorded individually with the help of PRAAT voice recording and analysis software 5.1 versions. Each subject was asked to phonate the vowel /a/, /i/ and /u/ at a comfortable pitch and loudness.

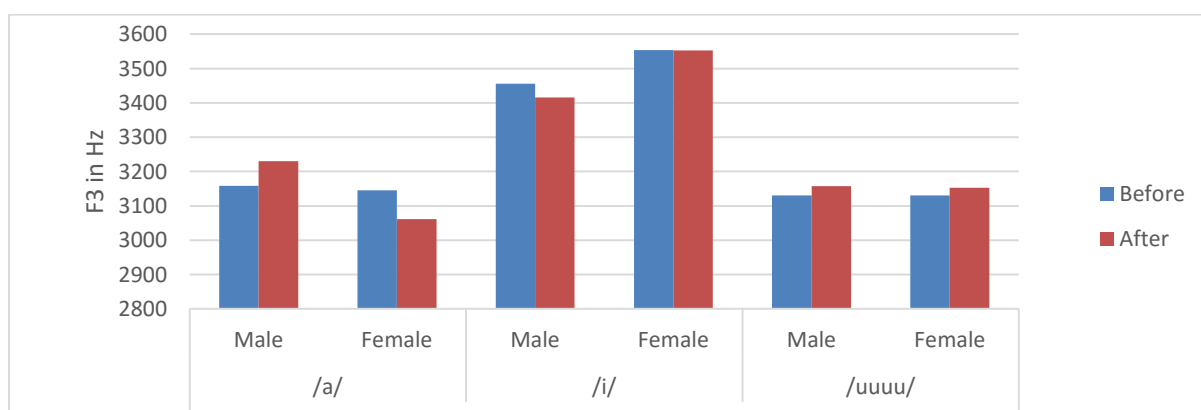
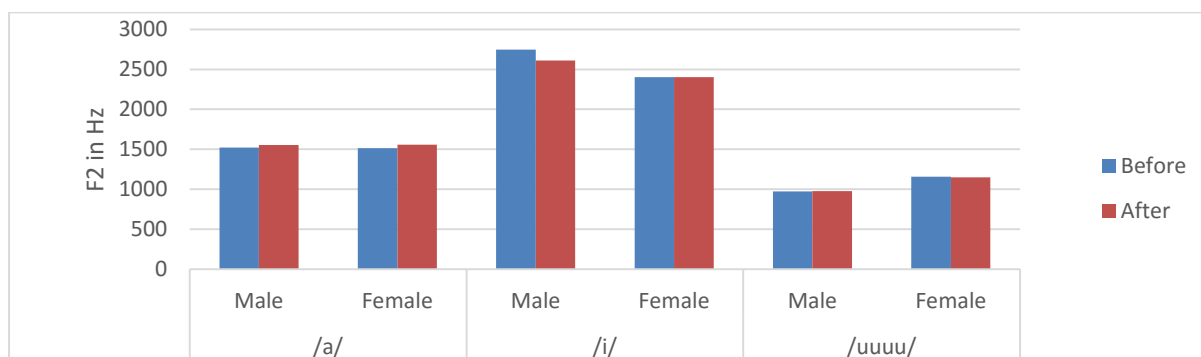
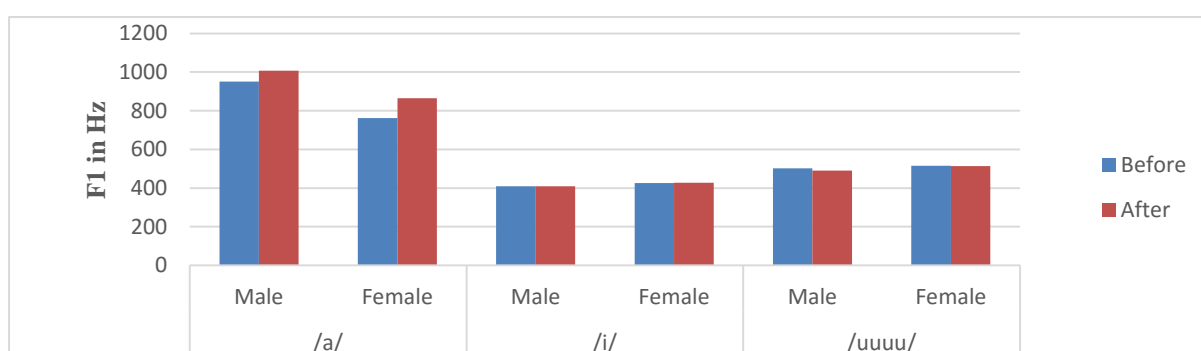
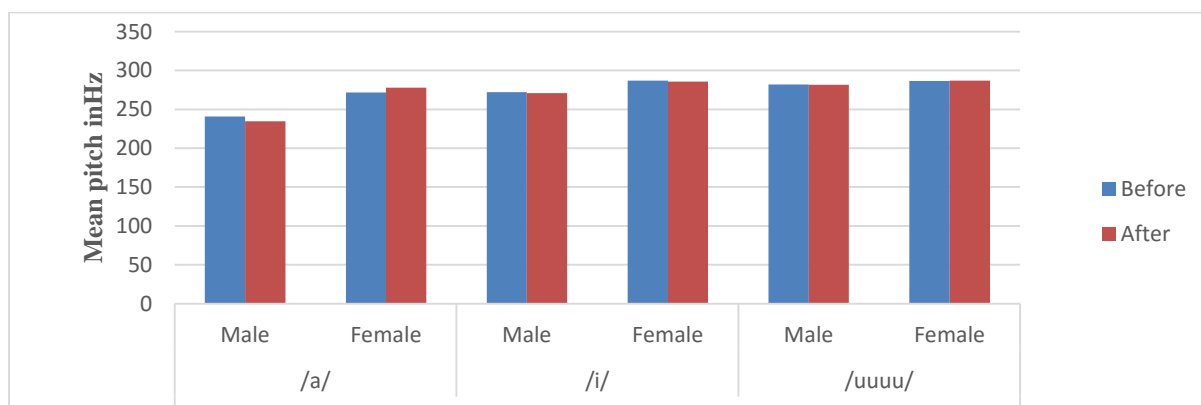
Analysis

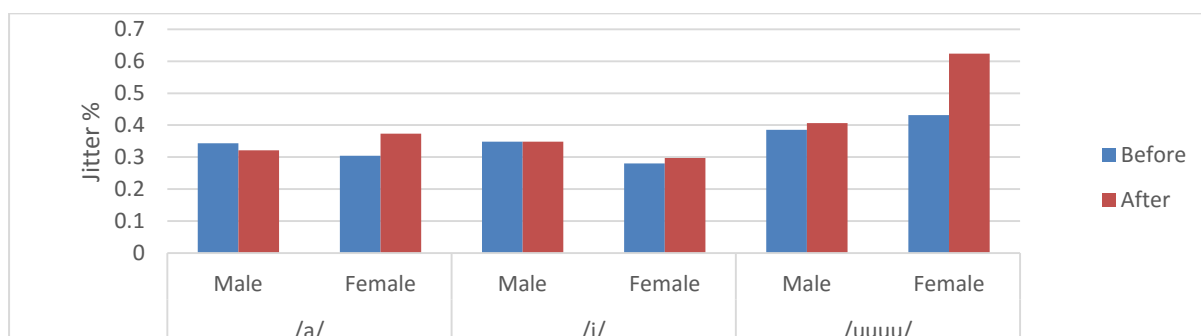
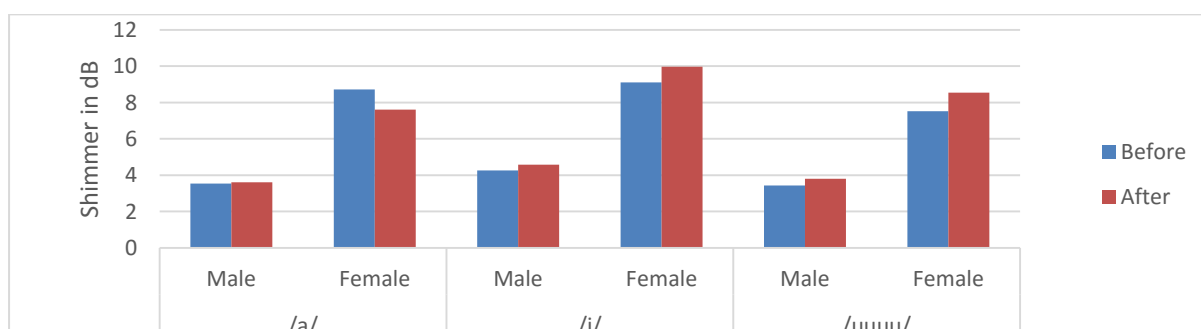
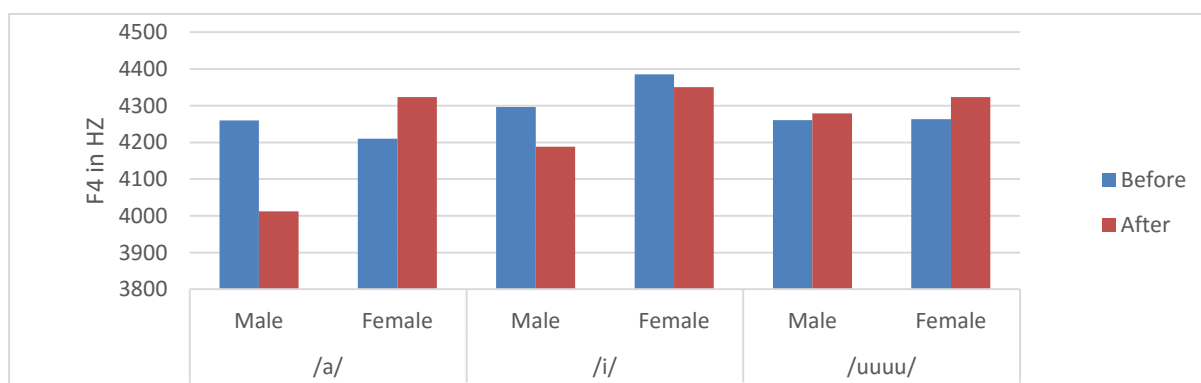
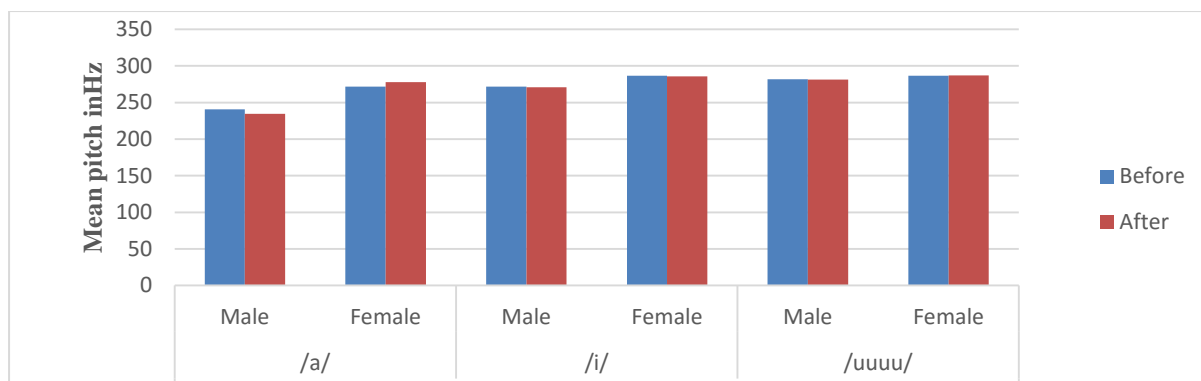
Obtained data were statistically analyzed to measure and compare the acoustic parameters like mean pitch, SNR, jitter, shimmer, F1,F2,F3& F4

Results and Discussion

The present study aimed at analyzing and comparing the acoustic parameters of typical school going children before and after class sessions.

50 typical school going children from a Malayalam medium school in Kerala were selected and voice samples were collected and analyzed.





Fundamental frequency, F1, F2, F3, F4, jitter and shimmer were analyzed before and after class sessions on a gender basis.

The results are shown in the figures. There was a difference in the parameters obtained before and after class sessions which was statistically not significant.

Conclusion

Frequent insults to the vocal folds can end up in chronic voice disorders. School children are at a risk of developing voice disorders since they perform plenty some vocal abusive behaviors like yelling screaming, shouting etc. The results of the present study which aimed at the comparison of acoustic parameters before and after class sessions in typical school going children suggests that there were differences in the acoustic parameters but were statistically insignificant. A periodic monitoring of the voice characteristics is important for school children for preventing the development of further voice related disorders.

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Sreelakshmi R
Lecturer
Dr. M. V. Shetty College of Speech and Hearing
Mangalore 575015
Karnataka
India
lakshmilegacy.r@gmail.com

Nandhu S Mohan
Audiologist
Santhwana hospital
Trivandrum
India
smnandhu4803@gmail.com

Vishnu, V.K.
Clinical Supervisor
Dr. M. V. Shetty College of Speech and Hearing
Mangalore 575015
Karnataka
India
vishnuaslp@gmail.com