Available online at www.sciencedirect.com

SciVerse ScienceDirect

Procedia - Social and Behavioral Sciences 46 (2012) 4119 – 4124

Procedia
Social and Behavioral Sciences

WCES 2012

The availability of vocal training for improvement of accent and articulation defects in speech education

Kivanc Aycan [a], Gul Cimen [b], M. Betul Yerer [c]

[a]University of Erciyes, Fine Arts Faculty, Music Department, Kayseri, Turkey
[b]University of Gazi, Education Faculty, Music Education Department, Ankara, Turkey
[c]University of Erciyes,Pharmacy Faculty, Pharmacology Department, Kayseri, Turkey

Abstract

This study is designed to test the use of vocal training for articulation and accent defects which might be an important trouble while Turkish speaking. For this reason vocal training has been performed on a group of students selected voluntarily form the Erciyes University Turkish teaching profession 3rd class and the difference before and after vocal training accent and articulation defect improvements have been evaluated. To reach this general purpose pre-test and pro-test applications have been tested by "Vitalograph Alpha, Model 6000" portable spirometer device and "Praat vocal analyze program". Breathe management and thereby the accent factors that effect speaking are evaluated on even if they were improved after a programmed vocal training study over VC, FVC and FEV1 parameters. After voice training FVC ($p<0.001$) decreased and FEV1 ($p<0.001$) increased significantly whereas the VC has not changed significantly. Furthermore, with the help of the data obtained from the Praat vocal analyze program the accent and articulation defects have been evaluated over "Türk" and "vazifen" words and the duration of the voice the intensity, amplitude, maximum power frequency and pitch values are analyzed. This analyze revealed that after vocal training when we consider the "Türk" word, the intensity ($p<0.05$), amplitude ($p<0.05$), harmonics to noise ratio ($p<0.05$), duration ($p<0.001$) increased significantly. When we consider the word "vazifen", the intensity ($p<0.05$), amplitude ($p<0.001$), harmonics to noise ratio ($p<0.001$) and duration ($p<0.001$) increased significantly, the pitch significantly decreased ($p<0.001$).In conclusion, in the students who are having Turkish speaking education, vocal training studies are seen to be useful to improve the articulation and accent defects, which means that it is helpful to state accent expressions and breathe management to express the Turkish words correctly.

Keywords: Vocal training, Articulation, Accent, Speaking Education

1. Introduction

The study of vocal skill development provides teachers with strategies to enhance auditory processing and quality of speech. Auditory processing results in the ability to perceive and produce distinct phonemes, inflections, and pitches, and to sense the duration of sounds in language and in music (Patricia O'Herron, 2007)

The purpose of this paper is to discuss how a programmed vocal training can developmentally affect the accent and articulation problems in Turkish profession students thinking that these students will be teaching Turkish language to their students after graduation. The intent is to provide the best practices that may enhance the Turkish profession student's auditory processing and quality of speech. To a degree, the classroom teacher has the power to

1877-0428
doi:10.1016/j.sbspro.2012.06.210

manage the classroom sound environment, for students' attention, student behavior, etc. (McShane & Jones, 1990). The basic vocal training methods are widely used to improve the articulation and accent problems and for this reason, this study is aimed to investigate the effects of a programmed and specialized vocal training in Turkish language to use it in an appropriate way.

In oral reading, the intentional grouping of words into phrases is called prosody. Melodic qualities of phonemes are evident in certain languages, particularly the Turkish language. For this reason, the Turkish profession student's who will be teaching this language after graduation should enhance prosody. "By pausing and changing dynamics on specific words and syllables, the text becomes segmented into comprehensible chunks. Prosody also refers to the intonation, stress, and rhythm of speaking and reading aloud." (Krumhansl, 1990). Prosody in speaking parallels singing in several ways as defined by Gerard and Auxiette (1992): "The temporal evolution of the spoken string that constitutes prosody is usually studied by considering three variables: the rising and falling of the voice *pitch* and *intensity*, and the rhythm" (p. 94).

Effective use of the sound elements in prosody provides interest to the listener and demonstrates fluency by the speaker. Sound elements are heard within a context, organized in pitch and time (Krumhansl, 1990) As well as the musical note has a frequency, or pitch, and a duration all the organized words within a text have the same sound elements. Furthermore, the word stress changes from language to language affecting these parameters (Samuelsson, 2009).

From another view, for the achievement of a right accent and articulation one should be able to use his breath properly. The vocal training starts by establishing a good and appropriate voice function with the help of exercises designed to relieve tension and with basic practical breathing and voice exercises. In this study, programmed and specialized voice training exercises have been used to improve the voice usage in a proper way.

It is commonly supposed that *respiratory* muscles are those involved in the breathing act, namely, the diaphragm, external and internal intercostal muscles, prelum abdominate, and the so-called accessory respiratory muscles (N. P. Aleksandrova, 2006) The control of expiratory muscles plays an important role in speech breathing since it makes it possible to regulate the loudness of the pronounced sounds (Stathopoulos, 1997; Huber, 2005)

Taking in consideration of all these factors, in this study the pulmonary volumes and capacities of the objects were determined before and after the programmed voice training to see whether this exercises have improved the breath managements of the objects. Furthermore, with the help of the data obtained from the Praat vocal analyze program the accent and articulation defects in these objects have been evaluated over "Türk" and "vazifen" words and the duration of the voice the intensity, amplitude, maximum power frequency, pitch and Harmonics to noise ratio values are analyzed.

2. Materials and Methods

The Turkish profession male and female students (n=29) in the third year of their education were included to the experiments and before starting the experimental procedures they were clinically observed by the physicians and phoniatrists if they have any pathologies regarding their vocal tract. Pre and post tests were determined using the same oral reading namely the "Ataturk's Oration to the Turkish Youth**"** and "Turkish Independence March".

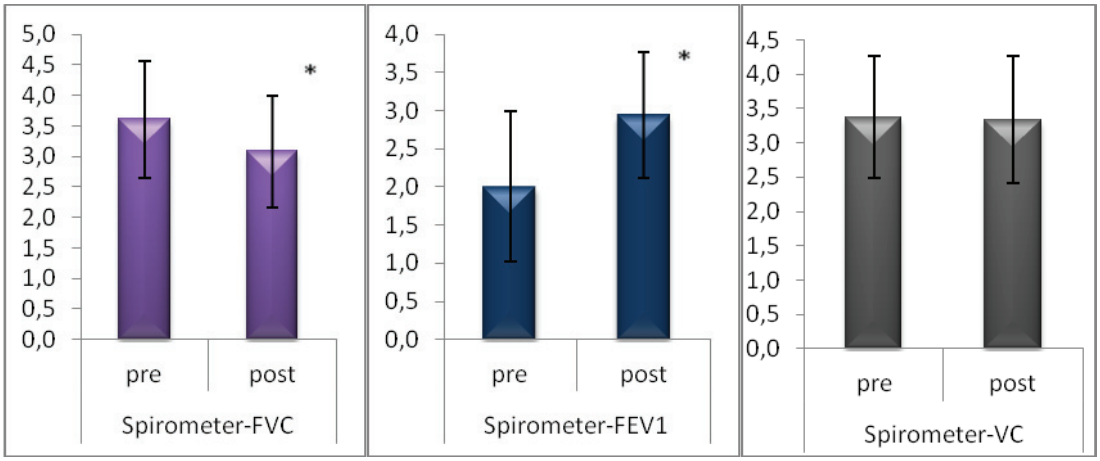
Their respiratory volumes and capacities were tested before and after the programmed vocal training exercises and the FVC (Forced Vital Capacity), FEV1 (Forced Expiration Volume 1st sec) and VC (Vital Capacity) were used to evaluate their breath management.

Furthermore, the vocal records of these subjects were taken by using a microphone in an isolated room at the Fine Art Faculty of the Erciyes University and were analyzed by using Praat vocal analyzing software before and after vocal training exercises. The exercises have been performed for 2.5 months regularly. From the Praat vocal, analyze program the accent and articulation defects in these objects have been evaluated over "Türk" and "vazifen" words and the duration of the voice the intensity, amplitude, maximum power frequency, pitch and Harmonics to noise ratio values are analyzed as described by the software manual.

The results were statistically evaluated by use of SPSS 11.0 and Shapiro test was made for the normalization and paired t test and Wilcoxon tests were used to compare the significance before and after vocal training. $P<0.05$ has been accepted as the significance degree.

3. Results

After voice training FVC (a) ($p<0.001$) decreased and FEV1 (b) ($p<0.001$) increased significantly whereas the VC (c) has not changed revealing that the forced vital capacity has been reduced however the volume of the expiration has been prolonged in the first second.

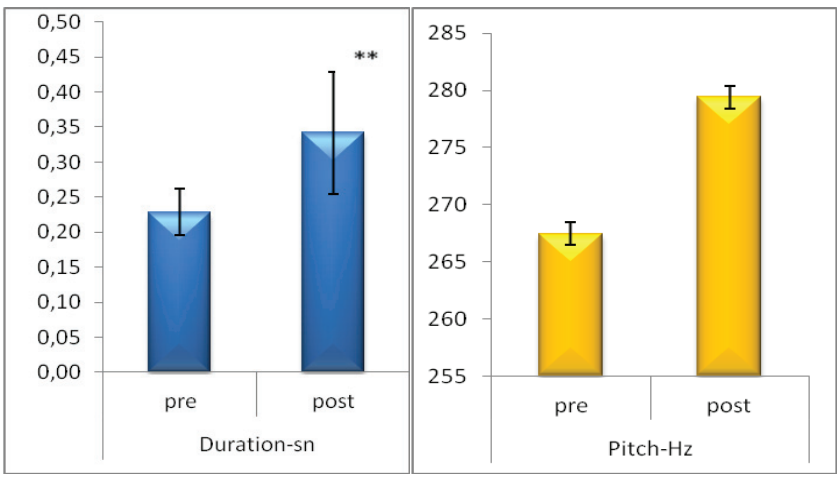


(a) (b) (c)

Figure1.Respiratory volume and capacity changes before and after a programmed vocal training.
(a): FVC: Forced Vital Capacity, (b):FEV1 (Forced Expiration Volume 1st sec),
(c):VC (Vital Capacity)*:p<0.001

When we compare the vocal analyze results, after vocal training when we consider the "Türk" word, the intensity ($p<0.05$), amplitude ($p<0.05$), harmonics to noise ratio ($p<0.05$), duration ($p<0.001$) increased significantly whereas the pitch and maximum frequency have not changed.

When we consider the word "vazifen", the intensity ($p<0.05$), amplitude ($p<0.001$), harmonics to noise ratio ($p<0.001$) and duration ($p<0.001$) increased significantly, the pitch significantly decreased ($p<0.001$) whereas the maximum frequency have not changed.



(a) (b)

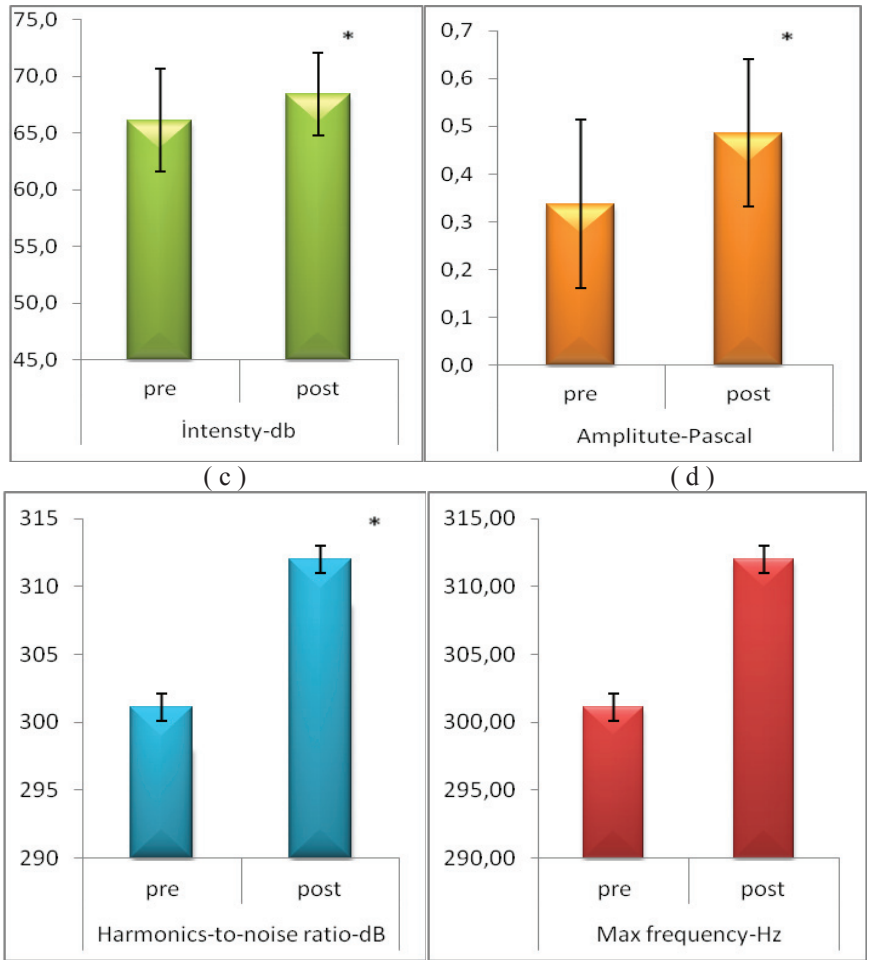
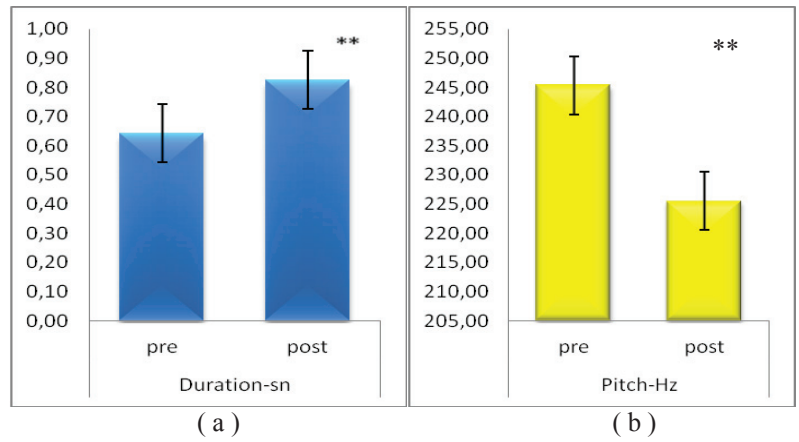


Figure 2. the duration (a), pitch (b), intensity (c), amplitude (d), harmonics to noise ratio (e), and maximum frequency (f) alterations after a programmed vocal training obtained from the "Türk" word. *: $p<0.05$, **: $p<0.001$



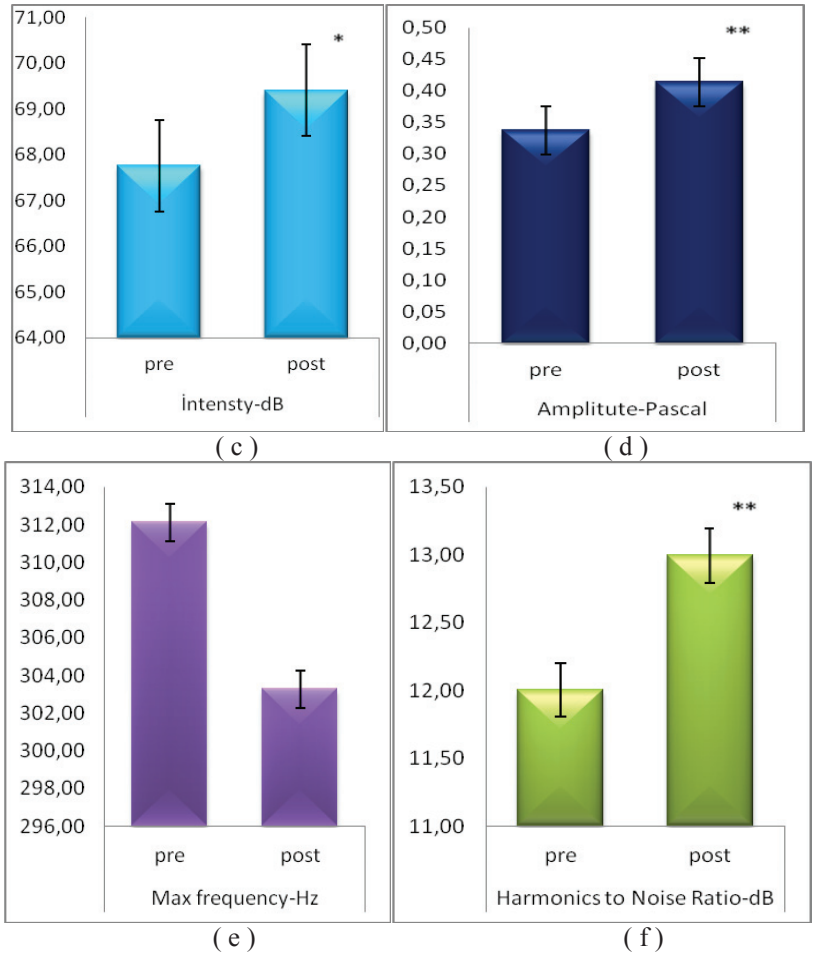


Figure 3. the duration (a), pitch (b), intensity (c), amplitude (d), harmonics to noise ratio (e), and maximum frequency (f) alterations after a programmed vocal training obtained from the "vazifen" word. *: $p<0.05$, **: $p<0.001$

4. Discussion

The voice is a basic tool in human communication and an important factor for the teacher's sense of profession. The voice perceptually consists of three basic components: (1) pitch, (2) loudness and (3) timbre. All these components are vital to the development of a good and functional voice, which is usually described as a voice with: pleasant voice quality, adequate pitch and loudness levels, and flexibility.

Jiang and Titze (1994) have described this pattern, as "Important aspects of direct voice training can be to instruct people in how to learn to use an adequate pitch level, to speak with less intensity and to avoid tension in the voice musculature during speech".

There is several evidence that the vocal training improves the use of language. For instance, Douglas and Williatts (1994) tested 7- and 8-year-olds in spelling, vocabulary, and reading, as well as their ability to detect musical differences in rhythms. The researchers found a significant correlation between a child's ability to detect rhythmic differences and the ability to read and spell. The researchers continued with a program of music instruction to develop auditory, visual, and motor skills, while the control groups received instruction in discussion skills. The music group showed significant improvement in reading after six months, whereas the discussion group did not.

Weinberger (1994) studied the effect of increased music instruction that decreased time spent on language and math instruction with 7- to 15-year-olds. Her findings indicate that the groups of children who received increased music instruction improved in language and reading. Children 6 to 9 years with reading difficulties were found to increase vocabulary skills through musical experiences in the classroom (Bygrave, 1995). Therefore, this study is performed to find out how a programmed vocal training improves the accent and articulation problems in Turkish language. For this purpose, the Turkish profession students were objected to vocal training since their duty will be teaching this language in a most proper way to their students. Their diction improvements will also be effective on their "teaching profession". There is some evidence in other languages as an American study of a group of teachers who had received vocal training during their basic education had significantly fewer voice problems after two years than the control group of teachers without voice training (Sapir et al., 1993).

By using programmed vocal training the subjects were aimed to use and control their breath properly since a right breath bring a right diction and improves the articulation and accent problems. Granstrem (1973) has described the general pattern of speech breathing is as follows: "Before pronouncing several phrases, a human takes a deep breath mainly due to the contraction of the diaphragm. Speech is accompanied by broken expirations that are synchronized with the pronounced words".

In conclusion, Turkish profession students are objected to programmed voice training and the improvement of their respiratory capacities and the articulation and accent problems have been investigated in this study. And after a programmed vocal training exercise for 2.5 months have significantly changed their respiratory capacities e.g. FEV1 reflecting that they started to be able to control their breath while speaking or reading. Furthermore, their voice qualifications were also improved tested over intensity, pitch, amplitude, maximum frequency, duration and harmonics to noise ratio. The intent was to provide the best practices that may enhance the Turkish profession student's auditory processing and quality of speech. This study is the known first study that a programmed vocal training can improve the articulation and accent problems which has been shown by using respiratory and vocal analyzes in Turkish profession students who will be teaching Turkish language to their students when they are graduated.

Acknowledgements

We acknowledge to Prof. Dr. Meral Töreyin, Assoc. Prof. Dr. Kudret Altun, Assist. Prof. Dr. Adnan Karaduz, Assoc. Prof. Dr. Mehmet Akif Kılıç, Assoc. Prof. Dr. Nalan Yigit for their contributions. The Research Foundation of the Erciyes University has supported this project.

References

Aleksandrova, N.P. (2006). Respiratory Function of Pharyngeal Muscles, *Usp. Fiziol. Nauk*, 37(3), 11.

Aleksandrova, N. P., & Breslav I. S. (2009). Human Respiratory Muscles: Three Levels of Control. *Human Physiology* 35(2), 222–229.

Bygrave, P. L. (1995). Development of receptive vocabulary skills through exposure to music. *Bulletin of the Council for Research in Music Education, 127*(4), 28–34.

Douglas, S. & Williatts, P. (1994). The relationship between musical ability and literacy skills. *Journal of Research in Reading,*17(2), 99–107.

Gerard, C., &Auxiette, C. (1992). The processing of musical prosody by musical and non-musical children. *Music Perception,* 10(1), 93–126.

Granstrem, M.P., & Kozhevnikov, V.A. (1973). Respiration and Speech, in *Fiziologiya dykhaniya* (Respiration Physiology), Leningrad: Nauka,

Huber, J.E., &Chandrasekaran, B., &Wolstencroft, J.J. (2005), Changes to Respiratory Mechanisms During Speech as a Result of Different Cues to Increased Loudness, J*ournal of Applied.Physiology*, 98, 2177.

Jiang, J. J., & Titze, I. R. (1994). Measurement of vocal fold intraglottal pressure and impact stres. *Journal of Voice* 8, 132–144.

Krumhansl, C. L. (1990). *Cognitive foundations of musical pitch*. Oxford Psychology Series, 17, New York: Oxford University Press.

McShane, E., &Jones, E. (1990). Modifying the environment for children with poor listening skills. *Academic Therapy,* 25(4), 439–446.

O'Herron, P., &Siebenaler D. (2007). The Intersection between Vocal Music and Language Arts Instruction: A Review of the Literature. *Update: Applications of Research in Music Education* 25, 16.

Samuelsson, C. (2009). Using conversation analysis to study prosodic problems in a child with language impairment. *Child Language Teaching and Therapy* 25(1), 59–88.

Sapir, S., Keidar, A., & Mathers-Schmidt, B. (1993). Vocal attrition in teachers: survey findings. *European Journal of Disorders of Communication*, 28, 177-85.

Stathopoulos, E.T., & Sapienza, C.M. (1997), Developmental Changes in Laryngeal and Respiratory Function with Variations in Sound Pressure Level, *Journal of Speech Hear.Research,* 40, 595.

Weinberger, N. M. (1994). Music and cognitive achievement in children. *MuSICA Research Notes,* 1(2), 4–9.

Zamuner, T. S. (2009). Phonotactic Probabilities at the Onset of Language Development: Speech Production and Word Position. *Journal of Speech, Language, and Hearing Research* 52, 49–60.