

## Introduction

Voice and speech disorders are common in individuals with Parkinson's disease (PD), and reduced loudness as well as reduced perception of loudness by patients is frequently reported. (1) The Lee Silverman Voice Treatment (LSVT®) has been reported to increase voice loudness in individuals with PD, and is typically administered 4x's/week for 4 weeks in 60 minute intensive sessions. Despite reported benefits, referral to speech therapy has been reported to be as low as 4% for persons with a diagnosis of Parkinson's disease, (2) and the intense schedule of the LSVT® may be problematic for individuals who are working, live far from a licensed and LSVT®-certified SLP, or rely on others for transportation. Following completion of formal speech and physical therapy, patients are instructed to continue daily practice of learned exercises, yet it has been reported that improvements made following a regular physical rehabilitation program are often not sustained when normal activity is resumed (3), and this may apply to speech and voice as well, particularly when individuals have concomitant problems of memory or lack the skills set to adhere to recommendations. (4)

## Objective

To explore perceived benefit persons with Parkinson's disease report, as well as what statistically significant effect might be demonstrated following participation in Voice Aerobics™, a voice and exercise class led by a speech-language pathologist and held weekly at a community based center for persons with Parkinson's Disease.

## Material and Methods

Voice Aerobics™ was created in 1999 as a weekly class for persons with Parkinson's disease who had completed formal speech therapy. The 60 minute class, couples vocal function exercises with physical exercises. Since 2008, a recorded version of the class has been available as a DVD for independent home use. Improvement in voice use and overall communication, social interaction and independent home practice using a recorded version of the class were outcome measures. Qualitative and quantitative data were collected.



## Participants

21 individuals completed pre-post class surveys following participation in a minimum 4 classes.  
Age: mean = 74.06 years (SD = 5.78 years)  
Time since diagnosis = 7.85 years (SD = 5.56 years)  
9 female and 12 male  
Two post-DBS. ( 1 < 6 months; 8 years )  
8 previous ST (5 previous LSVT), 2 currently enrolled in speech therapy.  
All retired  
A 5 point self-assessment ordinal scale of voice and speech was completed by class participants. (0=poor 2- 3=ok 4- 5=great) for quantifiable data.  
The VHI-10 (Voice handicap Index (5) abbreviated form) is an instrument used to quantify patients' perception of their voice handicap, and was completed by participants pre and post class participation.

## Results

**Wilcoxon Signed Rank Test was used with a pre-set P value of <0.05**

The change that occurred with the treatment is greater than would be expected by chance and statistically significant improvement in speech loudness [from the patient's perspective] ensued from treatment (P=0.027)

Compared to reports of deficits in the perception of speech loudness, there are relatively few studies of perceptual deficit affecting other specific dimensions of speech.(6)

No significant difference in rate of speech P= 0.217

No significant difference in clarity P= 0.296

No significant difference in intelligibility P= 0.465

VHI no significant change P= 0.579

The Voice Aerobics™ program when provided in a group setting yielded a statistical difference in how persons with Parkinson's self-rated voice loudness.

9 class participants report using the Voice Aerobics™ DVD independently at home an average 2 times/week

## Participant Comments

Motor improvements reported:

"Increased range of motion," "more flexible," "breathing properly," learning about my body"

Liked most about the class:

"Friendship," "improved speech," "movement with voice drill," "awareness of breathing," "fun," "shows that I need to improve my voice."

## Conclusions

A community based, weekly class combining voice practice with movement provided an opportunity to educate persons with Parkinson's about speech and voice changes, introduce them to vocal function exercises, and provided a setting for social interaction, support, and communication. Improvements in voice loudness were reported by most. Non-voice improvements in flexibility, increased range of motion and breathing were also reported, and the effect of combining voice practice with general exercise warrants further investigation.

Limitations: Since persons with PD often inaccurately estimate their level of loudness, quantification of loudness and other speech parameters using acoustic analysis would be of benefit in future study. There was no control group.



## References

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## Acknowledgements/Contacts

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## Disclosures

The author is a faculty member, at Parkinson Place and has a financial interest in Voice Aerobics™ DVD which is commercially available as a recording.