



The Effects of the "SPEAK OUT!®" & "LOUD Crowd®" Voice Programs for Parkinson's Disease

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INTRODUCTION

- Parkinson's disease (PD) is the second most common neurodegenerative disorder after Alzheimer's disease.^[1]
- To date, clinical management for speech issues associated with PD has focused primarily on "one-on-one" individual voice therapy sessions to remediate the severely reduced volume of speech.
- The present study investigated whether a voice therapy program incorporating individual and group components, **SPEAK OUT!®** and **LOUD Crowd®** programs, could synergistically improve both the physical aspects of voice production and the quality of life of individuals with PD by providing social settings for interactive therapy.

RESEARCH QUESTIONS AND PREDICTIONS

- **Research Question 1:** Is group voice therapy effective in improving/maintaining vocal intensity of the individuals with PD, measured by dB SPL?
- **Research Question 2:** Do group therapy sessions contribute to the participants' perception of an improved quality of life, measured by the scores of the self-reported responses to the questions on the Voice-Related Quality of life (V-RQOL)?^[2]
- **Research Question 3:** Are there correlations between the objective and perceptual measurements of the vocal quality?

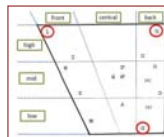
METHOD

PARTICIPANTS:

- 12 participants: mean age = 72.17 (range = 65-80, STDEV = 5.92)
 - **Males:** mean age = **73.50** (range = 65-80, STDEV = 6.09)
 - **Females:** mean age = **69.50** (range = 65-77, STDEV = 5.26)

VOICE DATA

- Glide up: Say /a/ from the lowest pitch to the highest pitch.
- Prolonged phonation of the 3 corner vowels.^[3]
- Production of 3 sentences used in the acoustic analysis of individuals with PD by Sapir and colleagues.^[4] The corner vowels were extracted from each sentence:
 - "Buy Bobby a puppy."
 - "The potato **stew** is in the pot."
 - "The blue spot is on the **key** again."

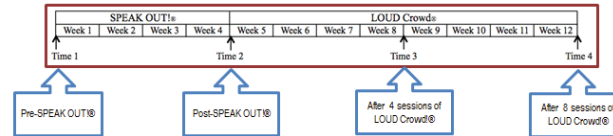


V-RQOL

- The investigator read the 10 questions of V-RQOL one at a time for the participant to respond.

DATA COLLECTION

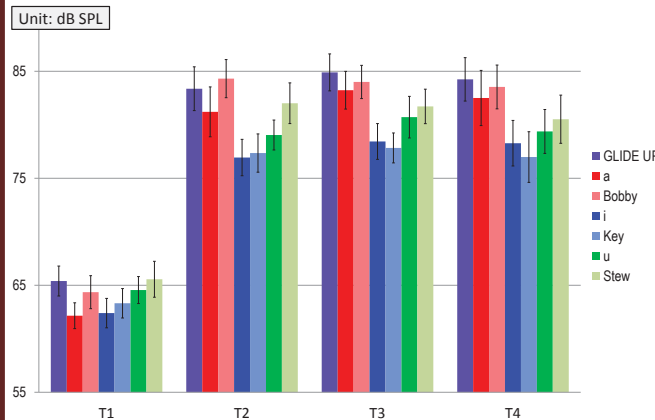
- Voice data were collected at four intervals during the 12-week study period as follows.



RESULTS

VOCAL INTENSITY

- The vocal intensity increased in all 3 corner vowels with prolonged phonation and in the produced sentences. The similar vocal intensity increase was confirmed during the gliding /a/ phonation.
- An Analysis of Variance (ANOVA) with repeated measures with Greenhouse-Geisser corrections revealed that the change of the vocal intensity over time was significant [$F(3,33)=43.3, p<0.001$]. A set of tests of Within-Subjects Contrast analyses identified a significant difference between TIME 1 vs. TIMES 2, 3, and 4 ($p<0.001$).



V-RQOL

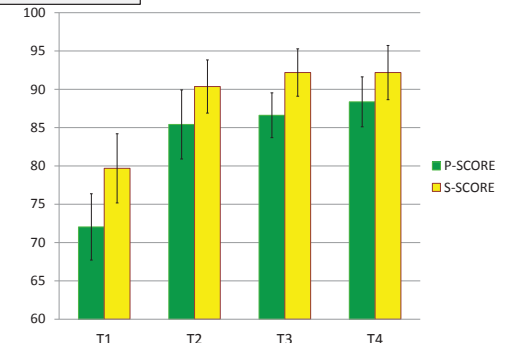
- Both physiological and social-emotional scores improved.
- An ANOVA with repeated measures with Greenhouse-Geisser corrections revealed that the changes of the scores over time were significant [$F(1.5, 16.9)=2128.5, p<0.01$].
- A set of tests of Within-Subjects Contrast analyses identified a significant difference between TIME 1 vs. TIMES 2, 3, and 4 (TIME 1 vs. TIME 2: $p<0.05$; TIME 1 vs. TIME 3 and TIME 1 vs. TIME 4: $p<0.01$).

V-RQOL scores

- 100: Excellent
- 75: Fair to good
- 50: Poor to fair
- 25: Poor
- 0: Worst possible

Source: "American Academy of otolaryngology – Head and Neck Surgery" (2003)

Unit: V-RQOL scores



DISCUSSION

- The data collected with 12 individuals with PD in this study suggest that the **SPEAK OUT!®** and **LOUD Crowd®** voice therapy programs are effective in:
 - Increasing the vocal intensity in prolonged phonation and in sentence reading measured by dB SPL. All 12 participants improved vocal intensity of three corner vowels.
 - Improving the participants' perception of their voice measured by V-RQOL.
- If future studies replicate the present results with greater number of participants, they will provide important information about the synergistic effects of the individual and group voice treatment sessions for the individuals with PD.

REFERENCES

1. de Lau, L. M. L. & Breteler, M. M. B. (2006). Epidemiology of Parkinson's disease. *The Lancet Neurology*, 5(6), 525-35.
2. Hogikyan, N.D., & Sethuraman, G. (1999). Validation of an instrument to measure voice-related quality of life (V-RQOL). *Journal of Voice*, Vol. 13, No. 4, 557-569.
3. Hixon, T.J., Weismer, G., & Hoit, J.D. (2014). *Preclinical speech science: anatomy, physiology, acoustics, perception*. San Diego, CA: Plural Publishing.
4. Sapir, S., Spielman, J. L., Ramig, L.O., Story, B.H., & Fox, C. (2007). Effects of intensive voice treatment (the Lee Silverman Voice Treatment [LSVT]) on vowel articulation in dysarthric individuals with Idiopathic Parkinson Disease: Acoustic and perceptual findings. *Journal of Speech, Language, and Hearing Research*, Vol. 50, August, 899-912.