



## Feasibility of group voice therapy for individuals with Parkinson's disease

Jeff Searl<sup>a,\*</sup>, Kristel Wilson<sup>a</sup>, Karen Haring<sup>a</sup>, Angela Dietsch<sup>a</sup>, Kelly Lyons<sup>b</sup>, Rajesh Pahwa<sup>b</sup>

<sup>a</sup> Hearing and Speech Department, University of Kansas Medical Center, Kansas City, KS, United States

<sup>b</sup> Department of Neurology, University of Kansas Medical Center, Kansas City, KS, United States

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### ABSTRACT

**Purpose:** The primary purpose was to demonstrate the feasibility of executing treatment tasks focused on increasing loudness in a group format for individuals with Parkinson's disease (PD). A second purpose was to report preliminary pre-to-post treatment outcomes for individuals with PD immediately after they complete the group program.

**Methods:** The group intervention is described. Fifteen adults with PD who participated in the group and three clinicians leading the group provided feedback about the execution of the intervention. The participants also provided voice samples and self-ratings of voice handicap once before completing the 8-week voice group and once immediately after completing the voice group. Outcome measures included voice intensity, fundamental frequency (F0) mean, standard deviation and range, maximum phonation time, and listener judgment of loudness.

**Results:** Feedback from the clinicians suggested that many, but not all, of the voice activities could be executed within a group setting. Participants with PD indicated they understood the focus of the group and that subjectively they felt the group was helpful for increasing loudness. Statistically significant increases occurred for voice intensity, F0 maximum, and F0 range. Voice handicap scores decreased significantly and 80% of the participants were judged louder post intervention.

**Conclusions:** Clinician and participant feedback indicated that it was feasible to execute most LSVT<sup>®</sup> tasks in a group format with some modifications. The preliminary outcome data indicate that the targeted behavior (voice dB and loudness) did change in the predicted direction as did several other measures. Future studies comparing outcomes of group intervention to the gold standard LSVT<sup>®</sup>, and exploring retention of treatment gains over time, are needed.

**Learning outcomes:** After reading the manuscript, readers will be able to: (1) Describe previous attempts at group intervention to improve voice for individuals with Parkinson's disease. (2) List three ways that the group intervention tried in this study differed from LSVT<sup>®</sup>. (3) Identify three limitations to this study that must be addressed before advocating implementation of the group approach in clinical situations.

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## 1. Introduction

Voice and speech disorders are common in individuals with Parkinson's disease (PD) (Hartelius & Stevens, 1994; Logemann, Fisher, Boshes, & Blonsky, 1978) and reduced loudness is frequently reported (Ramig, Fox, & Sapir, 2004). Unfortunately, pharmacological and surgical treatments that are often effective in managing PD symptoms in the limbs do

\* Corresponding author at: Hearing and Speech Department, University of Kansas Medical Center, 3901 Rainbow Blvd, MS 3039, Kansas City, KS 66160, United States. Tel.: +1 913 588 5937; fax: +1 913 588 5923.

E-mail address: [jsearl@kumc.edu](mailto:jsearl@kumc.edu) (J. Searl).

not consistently facilitate speech, and therefore, cannot be relied upon as a primary treatment approach for the hypokinetic dysarthria in this population (De Letter, Santens, De Bodt, Boon, & Van Borsel, 2006; Kompoliti, Wang, Goetz, Leurgans, & Raman, 2000; Quagliari & Celesia, 1977; Skodda, Flasskamp, & Schlegel, 2010; Tripoliti et al., 2011; see Trail et al., 2005 for review). Until the early 1990s, individual speech therapy for voice deficits associated with PD often yielded disappointing results with therapeutic gains sometimes limited in terms of the magnitude of change or the ability to retain improvements outside the therapeutic situation (e.g., Downie, Low, & Lindsey, 1981; Erb, 1973; Sarno, 1968). However, over the past 15 years, the Lee Silverman Voice Treatment<sup>®</sup> (LSVT<sup>®</sup>) has been tested via randomized controlled trials which have provided evidence of both immediate voice and speech changes and long-term retention of gains up to 2 years post-completion of the therapy (Fox et al., 2006; Ramig, Sapir, Fox, & Countryman, 2001). LSVT<sup>®</sup> is intended to increase voice loudness in individuals with PD, although improvements to communication extending beyond loudness have been documented, including voice quality (Baumgartner, Sapir, & Ramig, 2001), prosody (Ramig et al., 2001), and articulation (Sapir, Spielman, Ramig, Story, & Fox, 2007).

Several unique aspects of the LSVT<sup>®</sup> program are likely responsible for successful outcomes, including the intensity and frequency of the treatment (60 min, high effort sessions; 4 times/week for 4 weeks), and a focus on both sensory (i.e., recognizing appropriate effort and loudness level) and motor training (i.e., using increased effort and loudness). The intensity and frequency of the treatment are believed to be important, along with a simple and singular focus on being loud. The therapy is designed to facilitate the learning of a new motor task to the point where the higher effort and louder voice becomes an automatic behavior not requiring external cuing (Spielman, Ramig, Mahler, Halpern, & Gavin, 2007).

To offer therapy using the name LSVT<sup>®</sup>, a speech-language pathologist (SLP) must complete a certification course and administer the program as prescribed. This is done, in part, to help assure the individual with PD that they are receiving the therapy upon which the outcome research has been completed. However, the developers of the LSVT<sup>®</sup> program, and others, have recognized that the treatment schedule may limit how many SLPs offer, and how many individuals with PD receive LSVT<sup>®</sup> (Spielman et al., 2007). Scheduling a patient for four therapy sessions a week for 4 weeks in a row may be difficult for many SLPs unless they have specific time set aside to deliver LSVT<sup>®</sup>. The intense schedule may be problematic for the individuals with PD if they are working, live far from a licensed and LSVT<sup>®</sup>-certified SLP, or rely on others for transportation. These therapy access concerns have prompted a search for ways to increase accessibility to the program or to alter its delivery. In this study we describe the feasibility of executing group intervention on a less frequent treatment schedule than LSVT<sup>®</sup>.

### 1.1. Altered treatment schedules for loud-focused voice therapy

Spielman and colleagues (2007) have examined an extended version of LSVT<sup>®</sup> that they referred to as LSVT<sup>®</sup>-X. Twelve individuals with idiopathic PD received two 1-h sessions of treatment weekly for 8 successive weeks. The total face-to-face time between the patient and the SLP was equal between traditional LSVT<sup>®</sup> and LSVT<sup>®</sup>-X. The main difference between the two was the amount of home practice, which was significantly increased for LSVT<sup>®</sup>-X. Additionally, the amount of time between treatment sessions was doubled in LSVT<sup>®</sup>-X. The results indicated that individuals who underwent LSVT<sup>®</sup>-X did have a statistically significant increase in SPL that was comparable to traditional LSVT<sup>®</sup>. The SPL increase was documented immediately after the treatment block and 6 months later (with a non-significant drop in SPL at the 6-month mark compared to immediately post-treatment). VHI scores improved pre to post treatment (immediate and 6 months), although this was not statistically significant. Listener ratings also indicated improved speech post-treatment. The authors did highlight some potential issues with the extended program, including increased time required by the clinician for homework preparation, increased time by the client for homework completion, less billable time available since material preparation cannot be reimbursed, potential reduction in direct therapy during the twice weekly visits in order to review the increased homework load, and possible inefficiency in learning the target loud voice early in the therapy program.

Wohlert (2004) evaluated three different treatment schedules: 4 times per week for 4 weeks ( $n = 3$ ), 2 times per week for 8 weeks ( $n = 2$ ), and 2 times per week for 4 weeks ( $n = 6$ ). They reported an increase in voice SPL during reading for all subjects immediately after treatment. There was a trend for dB during reading to drop at 3 months post-treatment compared to immediately after treatment (7/10<sup>1</sup> decreased, 2/10 increased, 1/10 essentially unchanged). However, even with the drop in dB at 3 months, 9 of 10 still had a positive change in SPL during reading (mean = 6.6 dB).<sup>2</sup> Wohlert concluded that, overall, the majority of subjects demonstrated a positive gain in SPL post treatment (immediate and 3 months); she also noted that the schedule of treatment did not appear to have a predictable impact on outcomes although statistical comparisons among the 3 treatment schedules were not attempted. Clearly the small  $N$  per treatment schedule and non-random assignment to treatment protocols necessitates caution in generalizing results. However, the results are intriguing because a positive change in the therapeutic target did occur for the majority of patients and was retained for a time period.

The results from Wohlert and from Spielman et al., suggest that altering the LSVT<sup>®</sup> schedule of treatment may be possible although much more work is needed to answer questions such as whether expectations about the magnitude and retention time of speech gains should be altered for the modified approaches, whether the schedule advantages are negated by

<sup>1</sup> One subject was lost to follow-up after the immediate post-treatment data collection reducing the total  $N$  from 11 to 10.

<sup>2</sup> Note that Wohlert also included dB for maximum sustained /a/ as an outcome measure. However, the instructions used differed from those in the LSVT literature.

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