

Research Questions

In adults with idiopathic Parkinson’s disease (iPD), **what is the effect of SPEAK OUT!® on acoustic metrics** of intensity, articulation, and prosody; on patient self-assessment; and on listener perception (intelligibility and ease of understanding)? Only a subset of the acoustic data are presented here.

Participants

20 adults with iPD

- Age: median 69 yrs, range 47–83
- Hoehn & Yahr:¹ median 3, range 1–3
- Months since dx: median 45 days, range 1–189 months
- 12 men, 8 women
- No history of DBS
- No history of speech therapy within past few years
- Cognitive abilities sufficient to participate fully in therapy

Rationale for SPEAK OUT!®

SPEAK OUT!® addresses the abnormal sensory processing, decreased internal cuing characteristics, **impaired automatic motor behaviors**, and decreased vocal effort of iPD.²⁻³

SPEAK OUT!® adheres to the principles of behavioral-change-induced neuroplasticity and motor learning as applied to speech production, particularly intensive treatment with maximum effort.⁴⁻⁵

This project is dedicated to the memory of Daniel R. Boone, PhD CCC-SLP

Study Design

Each participant served as his/her own control with **three baseline assessments** within approximately two weeks before starting treatment. Then, **two follow-up assessments** were conducted: within one week and six weeks after completing the SPEAK OUT!® protocol.

SPEAK OUT!® Protocol

A total of 12 treatment sessions, three sessions per week for four weeks, 40 minutes each session.

Simple, global focus: intentional speech

Each session contained six components:

- Vocal warm-ups
- Vowel prolongation
- Intonation/gliding exercises
- Automatic sequences (e.g., counting)
- Oral reading mixed with short conversations
- Cognitive tasks (e.g., list three things to consider before buying a car)



Home practice (twice daily) was required, consisting of each of the six components listed above.

Some of the verbal cues to elicit intentional speech:

- Say it with intent!
- Say it purposefully!
- Speak deliberately!

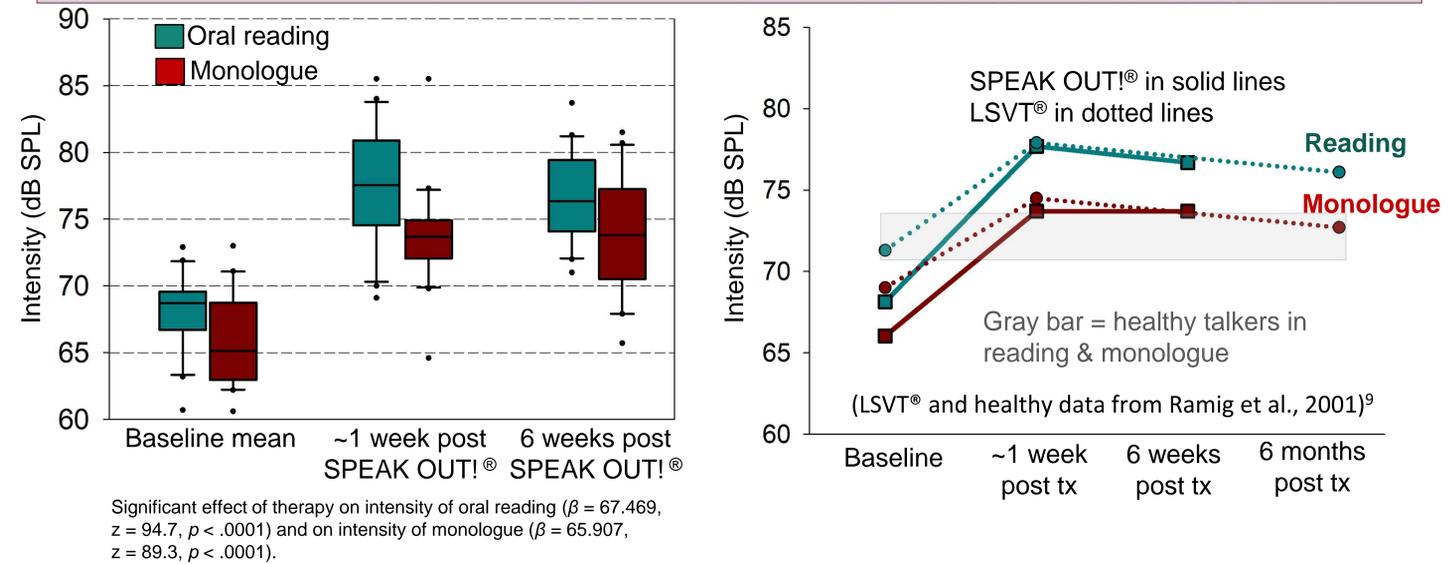
Each participant was provided with a free workbook containing therapy and home practice components.

Acoustic Measurement Methods

Digital audio recorder at constant mouth-to-mic distance. Calibration of .wav files with 1kHz tone of known intensity. Acoustic analysis conducted in Praat.⁶ Methodology of calculation of speech timing metrics consistent with the literature.⁷⁻⁸ All acoustic metrics calculated separately by two research assistants and checked for accuracy.

References provided in handout.

SPEAK OUT!® resulted in ~9 dB SPL increase in oral reading and ~7 dB SPL increase in monologue from baseline to 6 weeks after therapy, comparable with gains achieved by patients treated with LSVT®.



SPEAK OUT!® resulted in speech timing values similar to those of healthy talkers, suggesting improved articulatory precision in consonant production.

%V Percentage of total utterance composed of vocalic intervals.

VarcoC (Std dev of consonantal interval durations / mean vocal interval duration) X 100.

Consistent with the literature,¹⁰⁻¹¹ iPD talkers at baseline had a higher %V and lower VarcoC than healthy talkers, **implying articulatory undershoot, resulting in shortened and less variable consonantal segments**. Our novel data show that **after therapy, %V and VarcoC more closely approximated that of healthy talkers, implying improved articulation.**

All data calculated from monologue task. Data from first 10 participants.

	Mean %V (SD)	Mean VarcoC (SD)
Baseline	47.4 (3.7)	50.4 (3.9)
Post-Tx	41.0 (3.7)	65.3 (3.2)
mean change	-6.4	14.9
t-statistic (df), P-value	-7.25 (9) $p < .0001$	10.77 (9) $p < .0001$
Other studies:		
Untreated talkers with iPD ¹¹	45 (3.2)	54 (6.3)
Healthy talkers ⁶	42 (2.9)	62 (5.4)

Summary and Looking Forward

To date, SPEAK OUT!® has been assessed retrospectively in 78 pts¹² and prospectively in 65 patients,¹³⁻¹⁵ including the 20 reported here. Our study continues to accrue participants and additional acoustic, perceptual, and intelligibility measures will be reported.

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