

MAINTENANCE OF SPEAK OUT!® OUTCOMES FOR PARKINSON'S DISEASE: 7 YEARS OF "INTENT"

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BACKGROUND

Individuals with Parkinson's disease (PD) often show characteristics of **hypokinetic dysarthria**: *reduced loudness, reduced pitch variation, articulatory imprecision, and vocal roughness*.¹

The **SPEAK OUT! Therapy Program**, developed by the Parkinson Voice Project, trains patients to improve loudness, articulation, vocal quality, intonation, and facial expression. The typical course of therapy involves 8 to 12 individual sessions, followed by weekly SPEAK OUT! group sessions. Patients are instructed to practice at home twice a day.

Behrman et al. (2020) conducted a prospective clinical trial to assess the outcomes of SPEAK OUT! They tracked 40 patients with idiopathic PD from pre-treatment to six weeks after individual sessions. The therapy was associated with **increased mean intensity, frequency variation, cepstral peak prominence (CPP), and voice-related quality of life**.

One year later, Behrman et al. (2022) examined this same cohort of patients, and found that all outcomes were maintained, which is likely due to the weekly group therapy sessions supporting patient success.

The current study examined this cohort **two years** and **seven years** after enrolling in therapy. We examined the same outcome measures to determine long-term effects of SPEAK OUT! therapy.

METHODS

Participants: 40 patients (age: 46-84 years) with idiopathic PD completed the initial study. They completed SPEAK OUT! therapy and participated in weekly group sessions. Patients had mild to moderate PD symptoms at baseline.

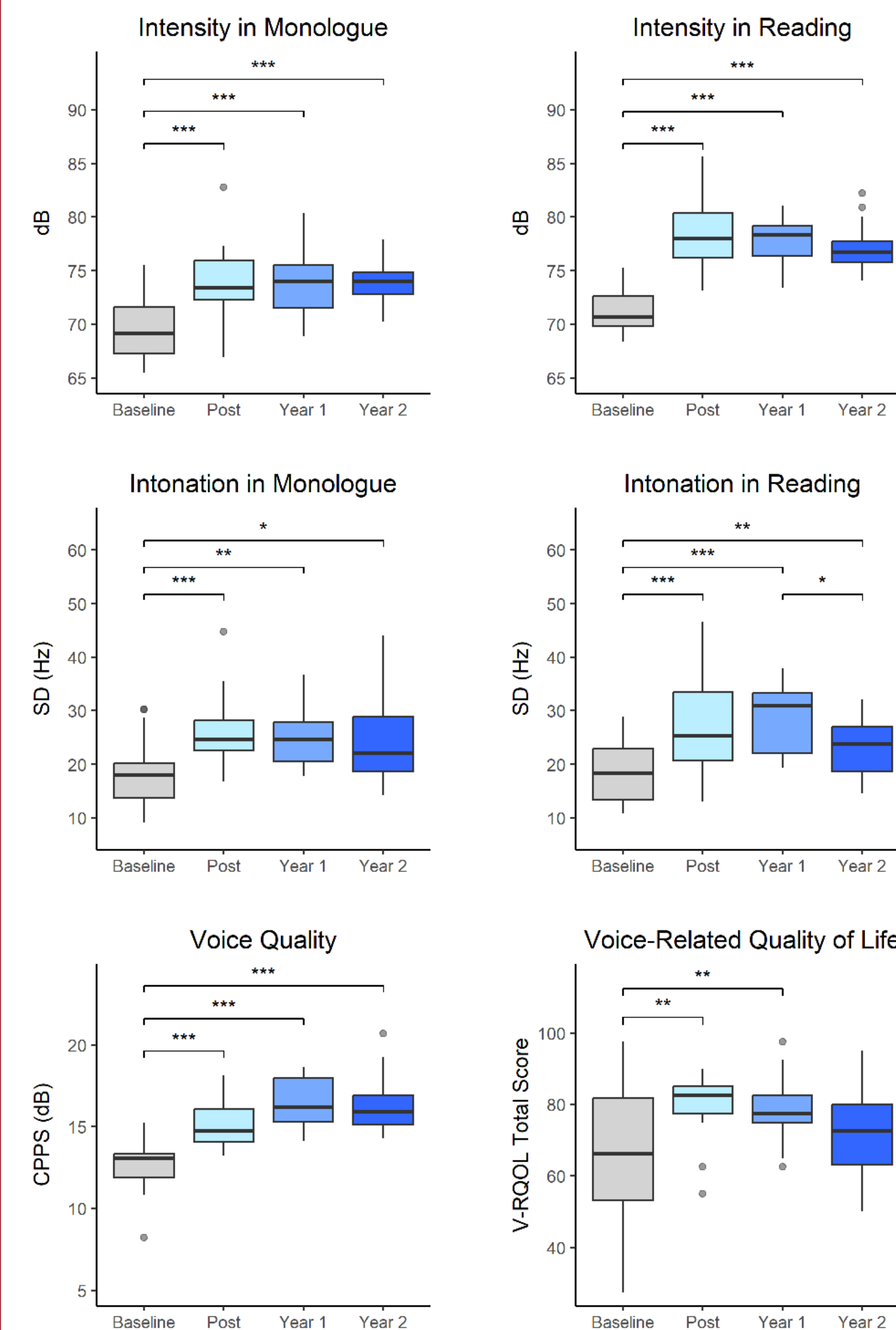
Attrition: At the one-year follow-up (Behrman et al., 2022), there were 35 participants (5 lost to follow-up).

- At the 2-year follow-up, there were **14 participants** (COVID-19 restrictions ceased data collection)
- At the 7-year follow-up, there were **12 participants** (from the one-year cohort, 6 were deceased, 2 withdrew, and 15 were lost to follow-up)
- Each follow-up cohort had a different set of participants due to the COVID-19 challenges.**

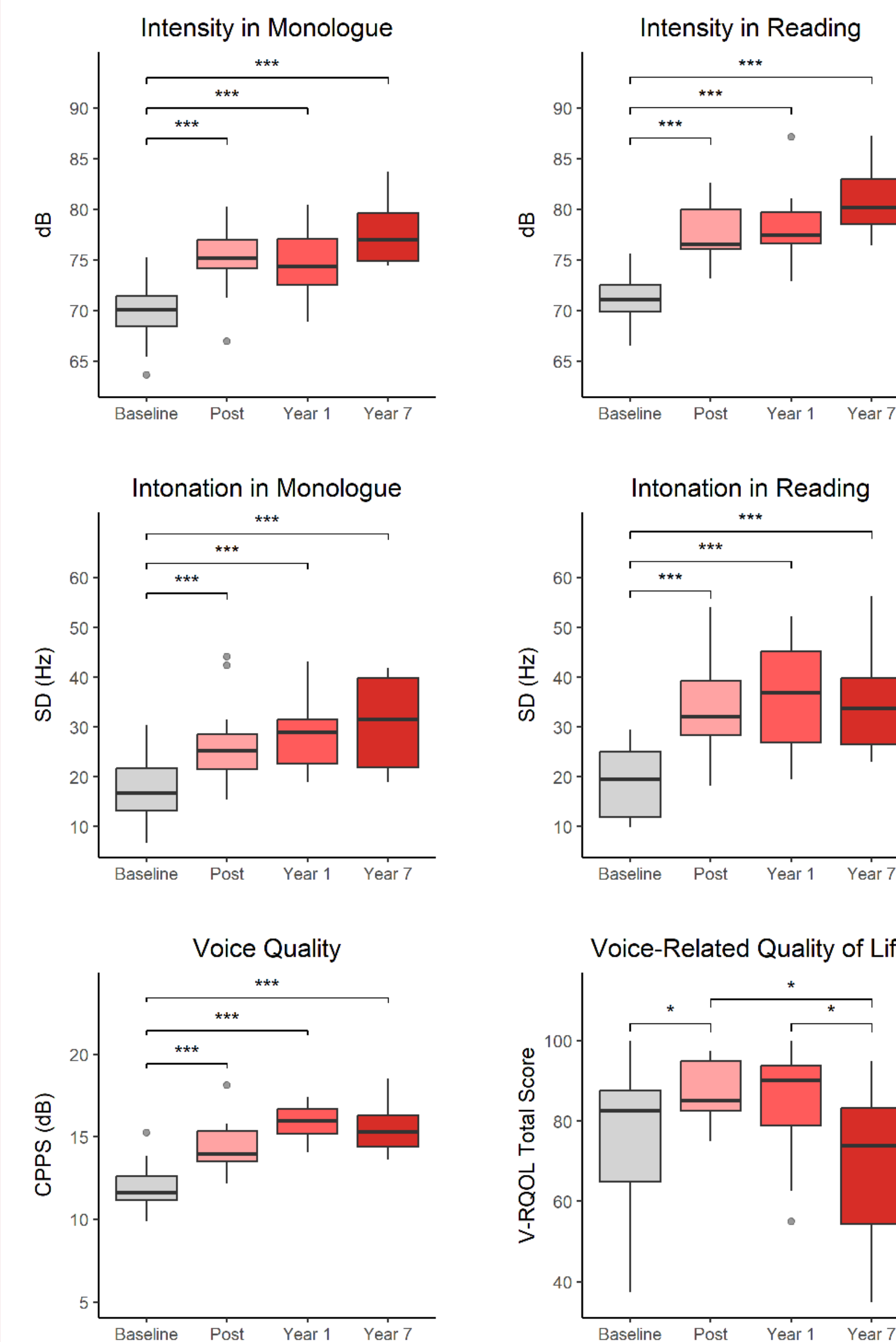
Data Collection: Assessments were conducted at baseline, 1-week post-intervention, and at 6-week, 1-year, 2-year, and 7-year follow-up visits. Audio recordings were collected during medication "on state" in a quiet room with a cardioid condenser microphone placed 30 cm from the mouth. Participants were not cued during the recordings.

RESULTS

Two-Year Follow-Up:



Seven-Year Follow-Up:



Assessment Tasks:

- Reading:** "The Caterpillar Passage" (adapted)
- Monologue:** Tell me about a favorite vacation or the place where you grew up
- Questionnaire:** Voice-Related Quality of Life (V-RQOL)

Analysis:

- Intensity:** Mean decibel (dB) from entire reading passage or 45 seconds of monologue
- Intonation:** Standard deviation of fundamental frequency (SD in Hz) from entire reading passage or 45 seconds of monologue
- Voice Quality:** Cepstral peak prominence smoothed (CPPS) from the sentence "We were away a year ago".

SPEAK OUT! Therapy:

- Dosage:** Individual sessions of 40 min, 3 days/week for 4 weeks for a total of 12 sessions (8 hours total)
- Home Practice:** 15 min practice 2x/day with workbook; after individual sessions, continue daily practice
- Maintenance:** Participants attend group therapy sessions once a week indefinitely
- Components:** Six exercises include warm-up, vowel, glides, numerical sequences, reading, and cognitive-linguistic tasks. Conversation is woven throughout to facilitate transfer to daily communication.
- Goal:** Increase cognitive focus on goal-directed, intentional behavior and minimize automatic motor behavior.

DISCUSSION

SPEAK OUT! has been shown to be a highly effective treatment program for individuals with Parkinson's disease.²⁻⁶ The current results show that intensity, intonation, and voice quality are all significantly improved to levels comparable with healthy controls,² and outcomes were maintained for two years and seven years in the SPEAK OUT! program.

Voice-related quality of life was significantly improved until the one-year assessment. V-RQOL subsequently returned to baseline, which may be expected as an effect of aging, rather than a direct association with PD or the SPEAK OUT! program.

To date, this is the longest duration of a longitudinal study of speech therapy for PD. Previously, the longest follow-up was a two-year study following the Lee Silverman Voice Treatment,⁷ which showed that loudness and pitch variation were still improved from baseline.

We hypothesize that the maintenance of outcomes observed here is largely due to the continued involvement in weekly therapy groups. This ensures that patients continue speaking with intent for as long as they are active in the program.

ACKNOWLEDGEMENTS

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