

***Comparing Traditional and Biofeedback Telepractice Treatment for Residual Speech Errors
(C-RESULTS TPT)***

Protocol NCT04625062

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Statistical Design and Power: C-RESULTS TPT

For inferential statistical analysis, a randomization test will be conducted for each participant. Randomization tests are computed within-subject, and we propose to replicate this comparison across 6 participants. Each randomization test will compare the two treatment types (traditional and visual-acoustic biofeedback) with respect to change in F3-F2 difference between pre-treatment and post-treatment probe in each session. In a previous randomization study comparing biofeedback and non-biofeedback treatment in 7 children with RSE (McAllister Byun, 2017), the median effect size of the difference between treatment conditions (d_2) was calculated to be 3.0. Calculations using GPower (Faul et al., 2007) indicate that our proposed within-participant comparison (10 observations in each condition) has 90% power to detect an effect of this magnitude. Relying on a precedent established in previous single-case studies of treatment efficacy (Maas & Farinella, 2012) and upheld throughout our own previous research (McAllister Byun & Hitchcock, 2012; McAllister Byun et al., 2014; Preston et al., 2014, McAllister Byun & Campbell, 2016; Preston et al., 2016; McAllister Byun, 2017), we will treat $d_2 = 1.0$ as the minimum difference between conditions that will be considered clinically significant. (That is, the difference between conditions must be at least as great as the pooled standard deviation). Our proposed within-participant comparison has power of .80 to detect this minimum effect size of interest. In addition, these power calculations ignore the fact that we will have multiple observations in each session; models that incorporate the nested structure of the data would presumably reflect higher power.