

Critical Review:

Old participants with severe hearing impairments who participated in the Bernhardt et al. (2003) study and were therefore familiar with the technology. Intervention began with an awareness component, followed by images with either ultrasound or EPG separately. Some measures were: phonetic transcription, acoustic analysis of vowel formant values and EPG tongue-palate contact patterns. Authors conclude that all the speakers, most notably /i/, reported to be difficult for this population due to high second and third formants. Subject 1 showed change on all vowels in some dimension, Subject 2 showed improvement on all measures, and Subject 3 showed positive change across all measures. In general, authors conclude 8 of the 15 vowels showed gains, but it is unclear under which of the three measures these gains are reported.

A strength of this study was using several measures to determine accuracy of target production: transcription, acoustic analysis, and EPG contact patterns, an improvement over the 2003 study which looked solely at transcription. In addition, raters outside of the study conducted both the Praat acoustic analysis as well as the EPG analysis. Authors of the study performed the transcription. However, it was rare that all three measures agreed with one another for each vowel. Some vowels showed improvement on transcription, but no change or unfavourable change on another measure. It is difficult, therefore, to determine whether or not these changes were significant. One reason for this inconsistency may relate to the data from the age-matched control. The hearing impaired subjects were compared to hearing speakers from the area, but data from only one male and one female were used. It is possible that a data set averaged from a large collection of control speakers would have been more valid.

were administered the *Computerized Articulation and*

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