**AT-HOME COMPUTER-BASED ADAPTIVE TRAINING IMPROVES PHONEME PROCESSING IN THE HEARING IMPAIRED.**

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**ABSTRACT**

The present study evaluated the effects of PC-based at-home training on the phoneme identification ability of hearing-impaired patients. Patients were randomly assigned to training or control groups and given phoneme identification tests before and after hearing aid fitting. After preliminary testing, a personal computer was installed in the home of the training group, along with software for presenting sounds, recording responses, and automatically reporting performance data via modem. Subjects trained for 40-60 minutes per day (5 days/week) in a single-interval, nine-alternative forced-choice phoneme classification task. Training involved 27 consonant-vowel and 27 vowel-consonant phoneme pairs spoken by a male and female talker, presented in continuous speech-spectrum noise. During training, the signal-to-noise ratio was adjusted on a trial to trial basis, using a 1-up, 1-down adaptive procedure. Phoneme-classification performance, assessed after one, two, four, and eight weeks, showed greater improvement in the trained groups at all test intervals, with little overlap between groups. Training-related improvements were similar in magnitude to the improvements associated with initial hearing aid fitting. Improved phoneme detection performance was also seen for phonemes spoken by novel male and female voices not used during training. Supported by DC005814 and the VA Research Service.

**BACKGROUND**

Hearing aids (HAs) restore lost speech cues to the hearing impaired, but HA users may use sub-optimal speech cues (Revesz et al. 1985; Londt et al. 1988). Training may help to restore optimal cues.

**TRADITIONAL APPROACH TO AUDIOLOGIC REHABILITATION USING SPEECH READING**

**METHODS**

Subjects: New HA users
- Recruited from VA Audiology Service
- Mild to moderate sensorineural hearing loss
- Screened for advanced hearing conditions

Two groups of 12 subjects each
- Immediate training
- Training started 1 week after HA fitting
- Pre-training data served as a control for training

- Delayed training
- Training started 9 weeks after HA fitting
- Pre-training data served as a control for training data

**SYSTEM OF TRANSFERRING DATA**

- Voice (2 male, 2 female) – blocked
- Voice (3 male, 3 female) – blocked, randomly selected

**RESULTS**

**ADAPTIVE AT-HOME TRAINING**

- Phoneme classification performance, assessed after one, two, four, and eight weeks, showed greater improvement in the trained groups at all test intervals, with little overlap between groups.

**DISCUSSION**

1. Training is effective in improving the speech understanding of new HA users. The application of at-home PC-based training could make it possible for large numbers of hearing impaired individuals to improve in their ability to understand speech.

2. Further improvements in training procedures may produce enhanced results and expand to inter-subject variability.

3. An additional group receiving lab testing and training is a group of experienced hearing aid users, who were hearing aids at least eight months before they began training. They are not discussed in this poster, but more information is available upon request.

**REFERENCES**

