Innovative Computer Tool Helps Hearing Impaired 'Train' At Home

University of California, San Francisco (UCSF)



The aging of the baby boomer generation is stimulating innovation in many areas of technology important for seniors. Hearing loss is an especially common experience as humans age, and an estimated 28 million Americans currently suffer some degree of impairment. Although hearing aids can help, only an estimated 20% of the hearing-impaired seek treatment. Of those who do wear a device, many are disappointed with the results; hearing aids amplify sound but do not improve other aspects of hearing loss, like impaired frequency and temporal resolution. In addition to a mechanical aid, the hearing impaired need strategies to compensate for the fragmentary auditory signal.

> *With training, listening and comprehension abilities can improve and even result in changes in neurons of the central auditory system. However, individualized therapy to teach auditory skills has rarely been offered because it is time-intensive.*

A new interactive computer-based training program called LACE (Listening and Auditory Communication Enhancement) addresses this problem by allowing patients a chance to "workout" on their own to improve their listening skills and increase comprehension, especially in difficult conditions.

LACE is the brainchild of Dr. Robert Sweetow, director of audiology, and Jennifer Henderson-Sabes, a research audiologist, both at the University of California, San Francisco, and software programmers at NeuroTone, a company created by Gerry Kearby, founder of Liquid Audio. Over a four-week training period, LACE users practice understanding rapid speech, speech in a noisy background, or speech delivered simultaneously with a competing speaker. The difficulty of the comprehension tests is scaled to the user's ability, to prevent either boredom or frustration.

In addition, LACE provides training in cognitive skills that diminish with age, such as auditory memory and speed of processing. Finally, the program also helps users acquire new interactive communication strategies. The program was tested on 80 subjects and results showed that LACE training improved comprehension and increased user confidence in challenging listening situations. A portable version of the program for a hand-held device is being built to allow patients without access to a computer to experience these benefits.

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