Communication Support with the COMUOON Communication Support System

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The Comuoon is a device that makes a speaker's voice easier to hear, thus providing needed support for all types of hearing deficiencies - congenital, spontaneous, noise-induced (sensorineural), and age-related impairments. The high-performance microphone flawlessly picks up voices and delivers them with minimal distortion via an independently developed, egg-shaped speaker and high-clarity aluminum honeycomb speaker unit - a process that makes sound more intelligible for the hard-of-hearing and dramatically improves communication between the hearing impaired and unimpaired.

Until now, such communication required devices such as hearing aids, the use of which was the responsibility of the listener. There were no ideas to help hearing impaired listeners by improving speaker intelligibility. With conductive hearing loss, if impairment is due to failure of the middle or external ear, hearing can be restored with a hearing aid, yet for hearing loss due to defects in the auditory nerve or inner ear, there is often a lack of effective treatment choices. When talking to a person with sensorineural hearing loss, speaking in a loud voice often does not result in improved communication.

The Comuoon is a system that successfully makes speech easier to hear, through the use of a megaphone-like structure to increase directionality of speakers and reduce sound reflection off of walls. Sound clarity is also significantly improved thanks to a high quality audio circuit design and a high quality operational amplifier. Even with sensorineural hearing loss, audibility is improved to a point where even those with serious hearing loss of up to 70dB are able to achieve a high level of hearing.

[The usefulness of the Comuoon was presented by a team from the Otorhinolaryngology Dept., Institute of Medicine of Kyushu University Graduate School at the 115th Annual Meeting of ORL Society of Japan.]

In addition, it has been proven that combining the Comuoon with use of a hearing aid also results in drastic hearing improvements.

The increase in hearing loss due to aging is a global concern, but it is believed that improvements in communication with people with age-related hearing loss lead to improvements in quality of life as well. Also, improvements based on feedback from communication with hearing impaired children at educational institutions have resulted in enhanced speech capabilities. The Comuoon helps reduce the stress related to hampered communication and, while working together with medical institutions, we continue to develop technology that makes life easier.

Key Words: Hearing Loss, Hearing Impaired, Communication Support, Hearing Aid Device

Introduction

In this paper, we consider a way to provide support on the side of the speaker when communicating with a hearing impaired person. Hearing aids and cochlear implants are the most common devices used to help the hearing impaired, and are useful for a range of hearing impairments, from mild to severe. Nevertheless, not all people with hearing difficulties wear hearing aids, citing issues with usage difficulty and a stigma about being seen wearing one. Japan has a usage rate of only 14.1%, which is lower than the US and Europe.(1)

Even if everyone used hearing aids, that would not necessarily mean that no additional help is necessary. When communicating with a person with a hearing impairment, the ability to communicate can be affected by environmental acoustics and the speaker's vocal characteristics, leading to frequent difficulties in communication even when the listener is wearing a hearing aid or has a cochlear implant. In addition to hearing aids and cochlear implants, many other devices for helping the hearing impaired exist, such as FM listening systems and audio induction loops, but they frequently are difficult to set up and may not benefit all hearing impaired persons.

Hospitals are reported by people with hearing impairments as locations where a "auditory barriers" are felt, meaning patients and medical service providers have difficulty communicating with each other. This can create problems regarding informed consent, etc., with potential for issues that may put the patient's life in danger. (3) People with hearing impairments require different kinds of support depending on the environment where communication is occurring, as well as their own hearing abilities. This paper takes a look at the Comuoon Table-Top Communication Support System, a device that provides an innovative support method via

compromise by the speaker, without need for extra effort on the part of the listener, such as wearing a hearing aid, etc.

Background behind research and development of the Comuoon

While working at my previous job at EMI Music Japan, a main reason why I decided to devote myself to researching the possibilities of using a speaker system for the hearing impaired via a non-profit was that both my grandmother and father were hard of hearing. As the years progressed, it became harder to speak with my grandmother. Attempts at communication would go unnoticed, and as a result, she would often feel disconnected and discouraged. As we continued our research, I heard from my grandmother that while she wished to speak with her family, she feared her hearing impairment made it too much trouble for her family members, leading to a marked drop in communication.

At that time, I increasingly realized the importance of studying about listening, and through the NPO, I worked to understand hearing impairment and to enlighten normal listeners regarding hearing impairments. While researching speakers for use in helping with hearing impairments, I thought about how we, as people doing the talking, can work to help people with hearing impairments - something contrary to the thinking behind hearing aids - and that's how we came to research the Comuoon Communication Support System.

Optimal support system for voice listening

The Comuoon features a megaphone-like speaker enclosure to increase loudness at the speaker front and improve directionality, thereby preventing reflections of sound off of walls, etc., and reducing mic feedback, to provide an easy listening experience. (Figure 1A)

COMUOON

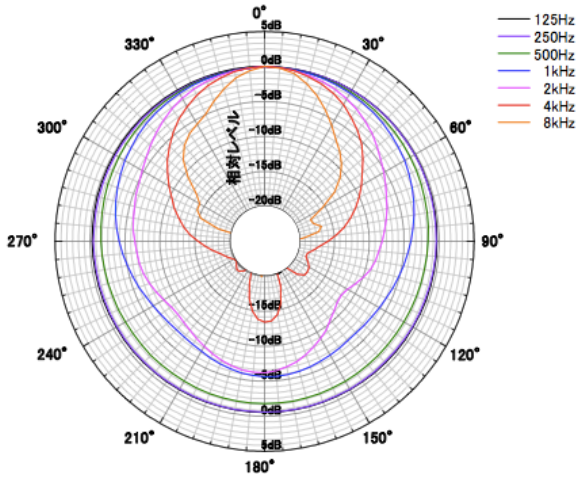

Figure 1A

In addition, by using our proprietary aluminum honeycomb speaker, high quality circuitry design technology, and a high quality operational amplifier, there are dramatic improvements to distortion, making for increased intelligibility even for people with sensorineural hearing impairments. Even at higher volumes, where hearing impaired people often find distortion inhibits intelligibility, we have made significant advances in clarity.

As a result, we've accomplished high levels of hearing improvements without a hearing aid, even at advanced levels of hearing impairment equivalent to 70dB.

*Usefulness was reported at the 115th Annual Meeting of ORL Society of Japan by the Otorhinolaryngology Team of the Faculty of Medical Sciences at Kyushu University. (4)

We have also found that people with severe hearing impairment can also see improvements in intelligibility through combined use with a hearing aid or cochlear implant.

In use at the Department of Otorhinolaryngology, Kyushu University Hospital

Listening communication design at a pharmacy

In Japan, following the passing of the Act to End Discrimination Against Disabilities in April 2016, communication speaker systems for the hearing impaired (Comuoon®) are being utilized in medical facilities out of consideration for patients with hearing disabilities (especially elderly patients). With regard to medicines, the number of generic drugs is increasing, medicine names are becoming more complicated, and the number of drug types is growing, making adequate explanation more important than ever. We are currently testing the effectiveness of the Comuoon® in establishing a better communication environment for both normal listeners and hearing impaired persons at the pharmacy counter of the JA Kagoshima Kouseiren Hospital.

The survey involved a subjective assessment of 15 staff members being read a list of 11 items from a medicine information sheet to test the listening change when the Comuoon® was turned off and when it was turned on. The results were that 6 members indicated improved intelligibility, 4 had slightly improved intelligibility, and 3 showed no change. There were especially marked differences for drugs with long names and "p" sounds. In addition, a subjective survey of listening improvement was given to 86 patients actually receiving prescriptions (mean age: 65.3 years). Of these, 42 patients (48.8%) experienced improved intelligibility, 42 (48.8%) showed no change, and 2 (2.3%) experienced decreased intelligibility. Additionally, 35 of the 86 patients had been waiting behind someone, and only 2 of these people (5.7%) responded that they could hear the explanation the person in front of them was receiving, while the remaining 33 patients (94.3%) could not.

The above resulted in a report in the Japan Society for Health Care Management stating that the Comuoon® is useful in improving the listening environment at pharmacies when providing complicated medicine explanations or giving medicine guidance. (5)

JA Kagoshima Koseiren Hospital

Conclusion

The Innovative Proposal of Universal Sound Design

Up until now, I've discussed the importance of not only having hearing assistance devices that require the cooperation of the listener - the person with the hearing disability - but also ways the speaker can also provide support. The Act to End Discrimination Against Disabilities enacted on April 1st, 2016, outlines "prohibition of discrimination" and "obligation for accommodation." As an example, imagine a patient visits a medical facility and, regardless of whether he or she is wearing a hearing aid, the patient receives a one-sided, inadequate explanation because a staff member assumes they can't hear much anyway, and the visit ends without confirming whether the patient understood what was explained. Such a case where a person with a disability doesn't receive the same consideration as someone else could be considered a "lack of reasonable accommodation."

Deaf and hard of hearing patients who pretend to understand what they hear because they do not want to bother the doctor or nurse are not uncommon. For elderly patients with hearing difficulties, many doctors are aware of the extreme frequency of situations at reception or outpatient care where communication is difficult even when speaking loudly.

Changes such as these shouldn't be considered mere adjustments made to abide by the Act to End Discrimination Against Disabilities; they should also be considered as part of the common hospitality offered to patients. When patients visit a medical facility, they already feel anxiety. When patients feel difficulty communicating with doctors or nurses, their anxiety increases. This is one reason I feel that Sound Field Clarity Improvement Systems for use by the speaker, like that used by the Comuoon, are going to gain attention in the future from a variety of fields.

Notes/Works Cited

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