Features

SoundRecover, the innovative Phonak non-linear frequency compression algorithm, first implemented in Naída (Nyffeler und Sturmann, 2008), breaks the high frequency barrier. SoundRecover compresses and shifts high frequencies which would otherwise be inaudible into an area of audible hearing. This broadens bandwidth for natural and feedback free reproduction of sound without being harsh or tinny. Audibility across a broad range of frequencies is vital for optimum hearing and understanding. SoundRecover was developed and verified in Australia on the basis of extensive clinical tests (Simpson, Hersbach & McDermatt, 2005; Simpson, Hersbach & McDermatt, 2006).

Subjects and Hearing Instruments

12 test persons (1 female and 12 male) between the ages 49 and 72 years (average age 67 years) participated in the study. Participants' hearing losses all range from mild for lower frequencies sloping to moderate in the high frequencies. Subjects were fit binaurally with instruments using xS (standard) receivers and open domes.

Method

The SoundRecover field study consisted of 4 appointments (Figure 1), during which the instruments were fitted and fine tuned and various test measurements were accomplished. Between appointments, the test subjects used the instruments at home in their normal daily lives. They were also provided with a remote control which allowed them to choose between an automatic program with SoundRecover activated and an alternate automatic program without SoundRecover, however they did not know which program had SoundRecover active and which did not.

Speech intelligibility in quiet and in noise was assessed with and without SoundRecover, using the Freiburg monosyllable test for speech in a quiet environment, and with the OLSA for speech in a noisy environment.

Speech intelligibility in quiet – Freiburg monosyllable test

The Freiburg monosyllable test was conducted in quiet at 50, 65 and 80 dB. The 20 single syllable words per test section of the Freiburg test were presented via a loudspeaker (0° azimuth, at head height) at a distance of 1 m from the test participant.

Speech intelligibility in a noisy environment– Oldenburg sentence test (OLSA)

Speech intelligibility in noise was assessed with the OLSA test. The signal-to-noise ratio for 50% speech intelligibility is adaptively determined by measuring the Speech Reception Threshold (SRT). Speech signals were presented via a loudspeaker (0° azimuth, at head height) at a distance of 1 m from the test participant, according to a standardized adaptive method (Wagner, Brand and Kollmeier, 1999). The noise was constantly presented at 65dB (S) from 5 speakers (head height).
Results

The results of the Freiburg test (Figure 2) indicate that speech intelligibility improves in quiet for soft speech, and with the expanded range of audibility provided by SoundRecover, additional improvement occurs (T1). After an acclimatization period of 4 weeks, the improvement is even further extended, compared to initial results (T4).

![Figure 2](image)

Subjects described their own voices as clearer, not too shrill, but with a pleasant brightness. It is important to stress that benefits from SoundRecover are best achieved with acclimatization period of at least 4 weeks. It is also noteworthy that for the clients whose results did not show benefit from SoundRecover, there was no negative impact on speech intelligibility. Hence, it is recommended to allow clients sufficient time to acclimatize to

Summary

The results of this Field Study indicate that SoundRecover improves speech intelligibility for soft speech in quiet situations. In noisy environments Phonak CRT Technology without SoundRecover already provides significant improvement which is further enhanced when SoundRecover is activated, particularly after acclimatization. The general first impression of the test participants to SoundRecover “on” was that sounds are more clear/sharp than without SoundRecover, but remain acceptably pleasant. The overall impression was very positive and objective speech intelligibility tests indicate a clear advantage when SoundRecover is active.

Reference


M. Nyffeler, B. Stuermann, Im Zentrum: besseres Sprachverstehen. Hörakustik 10, 2008. p.54-58

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