Abstract

The main goal of this doctoral thesis was to measure differences in speech intelligibility between older and younger hearing-impaired people and to establish the factors influencing the effectiveness of the use of hearing aids in the elderly. We focused on three related areas:
1/ To measure how the magnitude of difference of hearing and speech intelligibility in silence differs between younger and older populations, with a similar degree of hearing loss, in terms of word audiometry.
2/ To establish how speech intelligibility in competitive noise differs between younger and older populations with a similar degree of auditory defect, in terms of the Czech Test of Sentence Intelligibility in Babble Noise.
3/ To establish which factors affect the effectiveness of hearing aids for seniors, the motivation for the acquisition and regular use of hearing aids, and whether these factors correlate with age or lifestyle.

Methodology
1/ A group of 143 hearing aid users was divided into young (N = 60, mean age 15,9 y.) and seniors (N = 83, mean age 83,6 y.). For these two age groups we compared the differences between SRT values (understanding in word audiometry in silence, in the free field) and PTA values (hearing threshold in pure tone audiometry).
2/ A group of 423 persons, examined using the Test of Sentence Intelligibility in Babble Noise, was divided into younger (N = 191, mean age 55,8 y.) and seniors (N = 232, mean age 75,4 y). For these two age groups, we compared the test performance in the subgroups stratified by the SRT values (word audiometry in silence).
3/ Using a questionnaire survey among seniors, who were hearing aid users (N = 137, mean age 80,0 y.), we correlated the effectiveness of compensation with age, time of use, degree of hearing loss, and lifestyle, and we established the frequency with which difficulties arose.

Results
We have demonstrated a significant difference between hearing aid users in the senior and young age groups when comparing their intelligibility of speech in silence (always referring to the same degree of hearing loss and without the influence of hearing aids). We have demonstrated a significant correlation between age and diminished sentence intelligibility in competitive noise. We have demonstrated a significant correlation of time of use of hearing aids with their effect in the elderly population. No statistically significant correlation between age and motivation to use the hearing aid was found within the senior population, nor between age and the effect of the hearing aid. We have obtained data on the frequency of difficulties in hearing aid use by seniors.

Conclusion
Increased difficulty in the use of hearing aids in seniors is related, among other things, to a reduced ability to discriminate speech in silence but particularly in competitive noise due to their greater age. We have gained information on the relationship between time of hearing aid use and its effect on compensation for hearing loss, plus data on motivations and the frequency with which problems arise in the use of hearing aids in the elderly population.

Key words: seniors, speech intelligibility, speech intelligibility in noise, hearing aid effectiveness, motivation