

SoundLearning 2.0 optimizes situation-specific gain and compression settings in real world

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SoundLearning allows the hearing aid user to optimize the fitting for different input levels and for different listening situations. The effectiveness of SoundLearning™2.0 was evaluated in a recent study conducted at the University of Giessen, Germany. Fourteen experienced hearing aid users fitted with Pure 701 instruments were evaluated at the day of the fitting, and again after two weeks experience with SoundLearning™2.0. The participants were initially fitted with the Siemens FirstFit prescriptive algorithm.

As expected, the FirstFit algorithm was satisfactory for approximately 50% of the subjects, and only minimal training occurred. The other half of the subjects, however, trained more than 3 dB gain relative to the initial FirstFit, and were thus examined more closely. First, the learned gain for speech and noise listening conditions was measured for these subjects for soft and loud inputs (40 dB and 90 dB SPL). Speech intelligibility also was tested using meaningful monosyllables (Freiburger Einsilber) and subjective ratings were obtained for both loudness and sound quality in different acoustic environments.

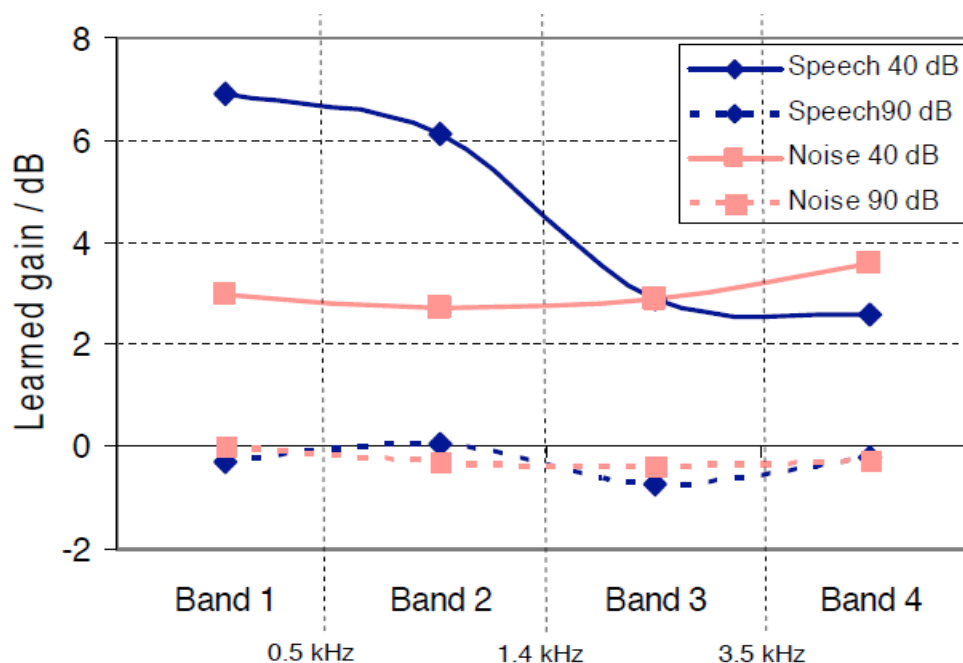


Figure 1. Learned gain (deviation for Siemens FirstFit) after two weeks for both speech and noise listening conditions. Average results are shown for both 40 dB and 90 SPL input levels.

Results revealed that gain, frequency response and compression settings differed for soft speech and listening in noise following the two-week real-world listening experience (Figure 1). The training effects of SoundLearning™2.0 increased gain for soft speech by 7 dB in low frequencies and 3 dB in high frequencies, whereas for low level noise a broadband increase of gain of 3 dB was observed.

Speech recognition testing was conducted before and after training. As shown in Figure 2, the optimization of the fitting provided through SoundLearning™2.0 significantly improved speech intelligibility by about 20% ($p < 0.001$). This is consistent with, and due at in part to the overall increase in gain for soft speech following training.

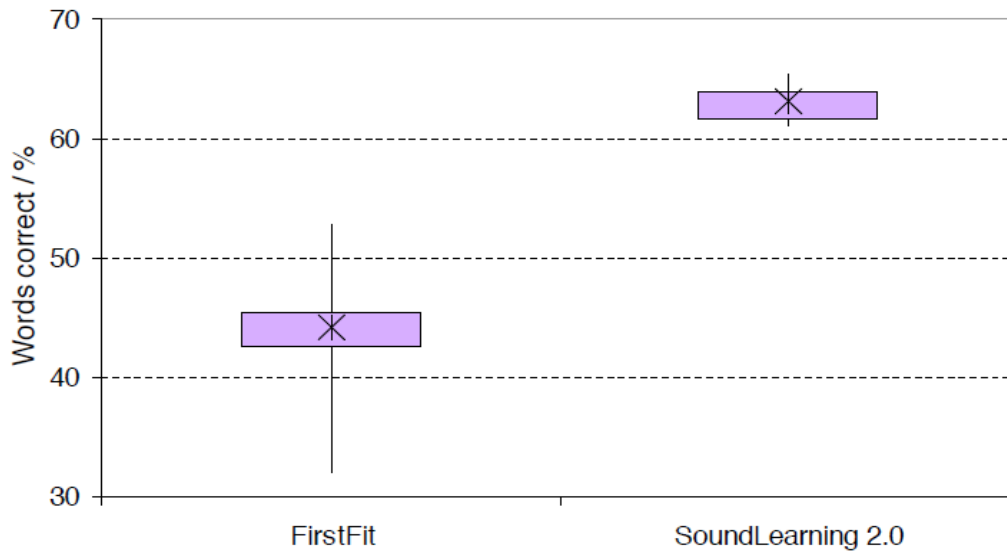


Figure 2. Speech intelligibility in quiet after initial fitting and after two weeks of learning. Medians (x), inter-quartile ranges (boxes) and minimum and maximum values (solid lines) are shown for both conditions.

This improvement in speech recognition was observed for all subjects. Subjective measures also revealed greater satisfaction with a) loudness for speech in quiet and b) sound quality for both noisy environments and speech in quiet for the trained setting.

Summary

SoundLearning™2.0 featured in the new Pure 701, Life 701 and Motion 701 instruments improves listening performance by automatically adjusting acoustic parameters to an individual's listening preferences for different environments. The results of this study demonstrate that for this group of subjects, SoundLearning™2.0 substantially increased gain for soft speech, thus resulting in improved speech intelligibility and listening satisfaction two weeks from the initial fitting. A smaller gain increase was observed for low level noise. SoundLearning™2.0 therefore considerably improves listening performance, thus optimizing the overall listening experience.

References

McKinnon, P., Chalupper, J. Clinical Applications of Trainable Hearing Aids. Paper presented at the 2010 annual meeting of the Australian Society of Audiology (ASA), May 2010, Sydney, Australia.