Letters to the Editor

A Question of KneePoint Level

It was with interest that I read the well-written article by Plyler et al on “The Effects of Expansion on the Objective and Subjective Performance of Hearing Instrument Users” (JAAA 16:101-113). I did enjoy the clarity of this article, as well as the clinical relevance. I have only one question for the authors: Why was the expansion knee-point in their study set at 50 dB SPL? Isn’t that a bit high? No wonder the recognition of low-level speech was found to be compromised by the usage of expansion in this experiment! In my opinion, expansion should be used with knee-point set at 40 dB SPL (or even lower). There would be less compromise to low-level input speech if this were the case. With this knowledge, most digital hearing aids today do indeed provide lower knee-points for their expansion.

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Reply to Venema

The issue raised by Dr. Venema underscores the importance of understanding the effects of the expansion parameters being applied.

The value of an expansion system can only be assessed with stimuli that traverse the expansion threshold periodically. Pearson et al (1977) demonstrated that ambient noise levels within typical living rooms approximate 40 to 45 dB. Therefore, the use of an expansion knee-point of 50 dB seems appropriate for a single-channel device if activation of expansion is desired. Utilizing expansion thresholds below 40 dB in a single-channel device may result in rare activation of expansion in daily use, thereby nullifying the effects of the feature. Stated differently, speech understanding would be preserved by lowering the expansion threshold; however, subjective benefit would be limited since expansion engagement would be rare.

As mentioned in the article, the results may have differed had multichannel expansion been utilized instead of single-channel expansion. Multichannel systems may result in expansion activation in restricted frequency regions as opposed to the entire spectrum. Additionally, with multichannel expansion, expansion parameters, such as threshold, may vary per channel; however, the effects of multichannel expansion on the objective and subjective performance of hearing instrument users remain unknown.

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REFERENCE