

Usability evaluation of self-fitting interfaces for personalized sound systems

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One way of reaching a larger target group with hearing-support technologies is to integrate such technologies into widely-spread, non-stigmatising consumer electronic devices such as hifi- or life-style-products. To enable the users to fit the hearing support to their own hearing loss, the ambient noise or their hearing preferences, one needs routines which allow fitting the sound transmission individually without any technical knowledge. Ideally, these routines should also enable the user to readjust the sound settings at any time depending on the current environmental conditions. In a sequence of several studies we investigated the usability of four different “self-fitting” approaches. Three of them operate on a limited parameter space, in which the user can vary frequency-dependent compression parameters with the help of haptic knobs, a two-dimensional touchscreen application, or a paired comparison. The fourth routine evaluates loudness impressions of the subjects to compute the compression settings. The user interfaces were evaluated with hearing-impaired persons between 55 and 70 years, who were instructed to adjust the sound settings of different audio stimuli to their personal preferences. The interfaces were investigated in an “Out of the box”-test design and video and audio recordings were made to evaluate the subject’s behaviour during the self-fitting tasks using a Grounded Theory approach. In addition, time logs and different kinds of performance data were recorded. For each user interface, the “System Usability Scale (SUS)” was determined. Preliminary usability analyses indicate a preference of the users for the 2D interface and the haptic knobs.