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Successful and unsuccessful users of bilateral amplification – differences and similarities in binaural performance

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Bilateral amplification seems to be the best solution for bilaterally hearing-impaired persons. Nevertheless, some individuals are unsuccessful with this strategy. Within this study, we compared results for different aspects of binaural listening for two groups of hearing-impaired persons: one group contained 11 successful and the other 11 unsuccessful users of bilateral amplification. The methods used measured both peripheral and central auditory function with an emphasis on binaural integration, as well as cognitive abilities. We included speech-in-noise and signal analysis performance as well as dichotic tests. Furthermore, hearing thresholds and hearing aid gain curves were measured. The subjects also answered to the questions of the Speech, Spatial and Quality of hearing Scale (SSQ). The speech-in-noise and signal analysis performance tests included the phenomenon of Binaural Masking Level Difference, BMLD. The results show differences between successful and unsuccessful users of bilateral hearing aids, manifested in both cognitive and auditory (central and possibly also peripheral) auditory function. Specifically, the group preferring bilateral amplification showed better speech-in-noise results, better results in the dichotic digits task as well as better subjective abilities in spatial listening. The hearing aids in the group preferring unilateral amplification showed slightly higher amplification than those of the subjects in the bilateral amplification group. Because of binaural loudness summation effects these subjects might have experienced the hearing aids as too loud when using both, even if none of them described problems with bilateral amplification in such terms. Most of the results therefore suggest, that unsuccessful users of bilateral amplification have degraded function of central pathways, centres and commissures. Peripheral hearing and slightly too high hearing aid amplification might contribute to a minor degree to problems using two hearing aids for those individuals.

