

Localization Comparison Using Traditional Hearing Aids and Personal Sound Amplification Products

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Age related hearing loss is the 3rd most common chronic condition reported by the elderly population (Oyler, 2012). Individuals suffering from untreated hearing loss may experience mental, emotional, social, and physical declines and may lead to withdrawal from different aspects of their lives (Lin et al., 2011). These difficulties can occur with even a mild degree of hearing loss (Krueger & Ferguson, 2002). Hearing aids are known to improve quality of life and patient communication, however, only a very small percentage of adults with hearing loss are wearing hearing aids. The consequences of untreated age-related hearing loss include changes in the brain, cognitive decline, dementia, depression, and social isolation (Mamo et al., 2016). With recent passing of the Over-the-Counter Hearing Aid Act of 2017, certain types of hearing technologies are now available to purchase over-the-counter and are particularly suited for those with a mild to moderate hearing loss (Kelley, 2017). Previous research has shown that there is no significant difference in an individual's speech intelligibility performance while using traditional hearing aids or Personal Sound Amplification Products (PSAPs). Here, we present data from 12 older individuals with mild sensorineural hearing loss on a spatial release from masking (SRM) task using the coordinate response measure (CRM) sentences and a localization task using two different Gaussian white noise bursts: low pass (1/3 octave wide centered at 500 Hz) and high pass (1/3 octave wide centered at 3150 Hz). Thirteen loudspeakers (Orb Mod 1), separated by 15 degrees in the frontal plane were used to present the stimuli. Initial analyses of the data indicated that, as expected, speech identification thresholds were significantly better for both colocated and spatially separated conditions while using either the traditional hearing aid or a PSAP compared to the unaided condition. However, the amount of release from masking obtained was similar in the hearing aid and unaided conditions and was significantly larger than the PSAP condition. Localization results revealed that as expected, the localization accuracy (measured in percent correct) was higher in the unaided condition compared to the aided conditions. In addition, the listeners localized the low pass noise significantly better than the high pass noise. This was true for all three listening conditions: unaided, hearing aid and PSAP. Moreover, the listeners had significantly lower root mean square error while using the hearing aids compared to PSAPs. Finally, the relationship between SRM and localization acuity will also be discussed.

Acknowledgements: This work was supported by the Dean, College of Health Professions, Towson University and by the Office of Graduate Studies, Towson University.

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Presentation Options: Either poster or podium

Conflict of Interest: There is no conflict of interest to disclose.

All procedures involving human subjects were reviewed and approved by the Towson University Institutional Review Board.