Verification Of Frequency And Amplitude Modulation Discrimination Tests On Ipad-Based Psychoacoustic App Suite (iPaas)

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Objectives: To compare non-speech auditory frequency and amplitude modulation discrimination thresholds between a Gold-standard Tucker-Davis Technologies (TDT) measurement and the same thresholds measured using an iPaas application

Background: Auditory discrimination is the ability to identify differences in sounds, and it is important for understanding speech in quiet or in the presence of background noise. Currently, non-speech auditory discrimination tests are used for research purpose, however, these useful tests are not available clinically. Non-speech auditory discrimination tests may provide additional information about the auditory processing in individuals with listening difficulties.

Methods: A total of 21 normal hearing adults participated in this study. 20 adults participated in the comparison of the frequency discrimination test (0.5, 1, 2, 4 kHz) and 10 in the amplitude modulation discrimination test (20, 32, 100, and 200 Hz). A three-alternative forced choice method was used to obtain frequency and amplitude modulation discrimination tests on the TDT and the iPaas system. Stimulus characteristics and test procedures were similar between both systems.

Results: In an overall way, frequency discrimination thresholds were similar between the two pieces of equipment. There were no significant differences in amplitude modulation thresholds between both systems.

Conclusions: Frequency discrimination and amplitude modulation thresholds obtained with both systems were close to those reported in the literature. The iPaas application can generate appropriate signals and achieve similar measurements as the research-utilized TDT equipment. It is proposed that the iPaas system provides a clinically useful way that audiologists can investigate the auditory processing abilities in individuals with listening difficulties. Further research is needed in order to provide larger sample sizes and with the inclusion of research participants with hearing loss and auditory processing difficulties.