

PR7: Digital Noise Reduction and Its Acoustic Effect on Consonants /S/ and /Z/

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ABSTRACT

Introduction: Modulation-based noise reduction (MBNR) is one of the common noise reduction methods used in hearing aids. Gain reduction in high frequency bands may occur for some implementations of MBNR and fricatives might be susceptible to alteration by given the high frequency components in fricative noise. The main objective of this study is to quantify the acoustic effect of MBNR on /s, z/. **Methods:** Speech-and-noise signals were presented to, and recorded from, six hearing aids mounted on a head and torso simulator. Test stimuli were nonsense words mixed with pink, cafeteria, or speech-modulated noise at 0 dB SNR. Fricatives /s, z/ were extracted from the recordings for analysis. **Results:** Analysis of the noise confirmed that MBNR in all hearing aids was activated for the recordings. More than 1.0 dB of acoustic change occurred to /s, z/ when MBNR was turned on in four out of the six hearing aids in the pink and cafeteria noise conditions. The acoustics of /s, z/ by female talkers were affected more than male talkers. Significant relationships between amount of noise reduction and acoustic change of /s, z/ were found. Amount of noise reduction accounts for 42.8% and 16.8% of the variability in acoustic change for /s/ and /z/ respectively. **Conclusion:** Some clinically-available implementations of MBNR have measurable effects on the acoustics of fricatives. Possible implications for speech perception are discussed.

KEY WORDS:

Modulation-based noise reduction; hearing aids; acoustic measures; fricatives

PR8: A Simple Physical Outcome Measures to Estimate Falls Risk in Community Ambulant Elderly

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ABSTRACT

Introduction: Asia is facing an aging population and a poor patient-staff ratio in the healthcare setting. Elderly above 65 have 33% chance to experience a fall, which are the leading cause of functional decline. This study aims to identify an efficient tool to estimate falls risk in community ambulant elderly. **Method:** Older persons greater than 65 years were recruited and screened for inclusion and exclusion criteria. Simple falls risk measures of Timed-Up-and-Go Test (TUGT), 30-seconds Chair Stand Test (30CST) and Functional Reach Test (FRT) were conducted and compared against each participant's Short Physical Performance Battery test (SPPB) results using Spearman's Coefficient and Pearson's Product Moment Correlation. Receiver Operating Characteristic Curves determined cut off values for TUGT and 30CST. **Results:** Data from 60 subjects of mean age of 75.40 ± 5.900 were analysed. Spearman's Rank Order Correlation between FRT and SPPB showed no significant correlation between SPPB and FRT ($r=0.187$, $p=0.152$). Pearson Product-Moment Correlation coefficient showed a strong negative significant correlation for TUGT and SPPB ($r=-0.670$, $p<0.000$) and a moderate positive significant correlation for 30CST ($r=0.502$, $p<0.000$). The best cut offs to identify community-dwelling elderly with higher falls risk were 15.46 seconds for TUGT [95%CI=0.785-0.985] and 9.5 repetitions for 30CST [95%CI: 0.682-0.924]. **Conclusion:** The TUGT and 30CST are acceptable simple physical outcomes measure of falls risk among the older subjects.

KEY WORDS:

Falls Risk, Short Physical Performance Battery, Functional Reach Test, 30s Chair Stand Test, Timed-Up-and-Go Test