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Title:

Listening test design for synchronous acquisition of physiological data and cognitive performance in disturbing noise

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Abstract:

The influence of disturbing noises on cognitive performance has been repeatedly investigated. It has already been shown that noises, such as office-noise or background-speech, have negative influences on the listener's cognitive performance and make it more difficult to cope with the task. Here, cognitive tests offer the possibility to investigate this influence. Additionally, noise also affects the listener's physiological response. However, parallel acquisition of physiological data imposes some requirements on the cognitive test. Due to their design, many cognitive tests are not available for this purpose. To also investigate the listener's physiological response in subsequent investigations, the N-Back Test is validated as a cognitive test in this pre-study. The participants processed several trials of the N-Back Test with different sound conditions. The test procedure was already adapted to allow simultaneous acquisition of physiological data.

A comparison of error rates and reaction times of the participants shows the different influence of individual noises. Concluding from these results, it can be determined whether the influence of noise effects the processing of the N-Back Test and whether it is suitable for a parallel analysis of physiological responses. This study thus provides a basis for later comprehensive investigations of extra-aural effects of noise.

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