

The effect of sound masking on speech recognition

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Abstrak

In the current study, two experiments are reported that investigated the effects of simple white noise and mixture of white noise and other sounds on perception of speech. In both experiments, university students were recruited to listen to short sentences under various sound masking conditions. Experiment 1, where standard sets of speakers were used for both speech and masking stimuli, has shown that, compared to baseline where there was no masking sound, the participants had significantly greater difficulties in understanding the sentences where the average level of understanding was 28% for the white noise condition and 20% for the mixed noise condition in which white noise was mixed with pink noise and sounds of running water. In Experiment 2, a test model of the specially designed sound masking speaker was used to present the masking noise. Further, sounds of tweeting birds and healing music were added to the mixed noise from Experiment 1 to create the three masking noise conditions. The average level of understanding for the mixed noise condition was 14%, while that for the bird and music conditions were 24% and 30% respectively. The higher understanding rates for the latter conditions were due to lower volume of the mixed white noise in order to keep the overall volume including the birds and music at 55dB. There were also significant effects of sentence type and reading voice gender, suggesting that auditory legibility does not solely depend on the speech-to-noise sound level ratio, but also on other variables, such as, predictability of the sentences, and clarity of the speech. Feedback at the end of the sessions revealed that the participants found mixed noise less irritating than pure white noise, and they preferred mixed noise with bird tweeting or music even better. Thus, it was concluded that mixed noise with occasional sounds of tweeting birds, was the most suitable masking sound for commercial use, being efficient and not unpleasant.