

DETECTION AND LOCALIZATION OF INDUSTRIAL WARNING SIGNALS IN BACKGROUND NOISE USING MECHANICAL EARMUFF

Kamarul Akmal Ishak

The ability to detect and localize industrial warning signals in background noise while wearing hearing protector device is important for safety purpose. An experimental study was conducted to compare detection and localization ability in 2 types of warning signals of bell and horn using mechanical earmuff with 5 dB SNR. 30 young adults (15 males and 15 females) with normal hearing bilaterally, age ranging from 19 to 23 years old participated in this study (21.97 ± 0.97). Warning signal level at 90 dBA was presented for 3 times randomly from 60° , 120° , 240° and 300° azimuths while noise level at 85 dBA was presented at 0° and 180° azimuths continuously. Detection and localization score for both warning signals and each azimuth has been analyzed. Generally, the results revealed that detection score is significantly higher than localization score using mechanical earmuff [F (1,29) = 98.40, $p < 0.05$, size effect > 0.14 , statistical power $> 80\%$]. However, there is no significant difference in detection and localization scores between type of warning signals used [F (1, 29) 0.95, $p > 0.05$, effect size < 0.14 , statistical power $< 80\%$ and speaker's azimuths [F (3,87) = 1.20, $p > 0.05$, size effect < 0.14 , statistical power = 80%]. As a conclusion, with signal to noise ratio (SNR) of 5 dB SNR, the use of mechanical earmuff will cause degrading in localization score but not for detection score. Furthermore, type of warning signals bell and horn do not compromise sound detection and localization ability.

Ishak, K. A. 2009. Detection and Localization of Industrial Warning Signals in Background Noise using Mechanical Earmuffs. Bachelor of Audiology Thesis. Universiti Kebangsaan Malaysia.