

IS HUMAN COGNITIVE PERFORMANCE MODULATED BY A POWER-LINE FREQUENCY MAGNETIC FIELD?

Previous studies have not found consistent effects of extremely low frequency (<300 Hz) magnetic fields (MF) on human cognitive processing. Although low-level exposures are experienced by the general population, there is little research using MF intensities comparable to the highest levels of occupational exposure. To examine this highest level of exposure we evaluated possible effects of a 60 Hz, 3000 μ T MF on human cognitive performance. The experimental session consisted of a double-blind computer driven protocol (90 participants) with cognitive function assessed by repeated measures psychometric testing (statistical analysis: 3x2 mixed model ANOVA). As expected, there was a practice effect (improvement between blocks 1 and 2 on most tests). This was not consistent across all exposure groups as indicated by a significant interaction effect found on one of the working memory indexes: digit span forward ($F = 3.75$, $p < 0.05$). There was not, however, sufficient evidence to conclude this was a MF-induced effect on test performance. The absence of cognitive effects at this exposure level should be taken into account during the process of developing exposure guidelines. Future studies should increase exposure intensity until a reliable threshold for cognitive effects is found and the mechanism responsible is identified.