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**EFFECTS OF 50 HZ INTERMITTENT MAGNETIC FIELD
EXPOSURE ON HUMAN PERFORMANCE AND
CARDIOVASCULAR RESPONSE**

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of the requirements for the degree
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ABSTRACT

One hundred subjects (aged 18-48 years) were exposed and sham exposed to a 100 μ T intermittent magnetic field, modulated sinusoidally at 50 Hz. To examine the effect of field exposure on performance, a two alternative forced-choice duration discrimination task with 3 levels of difficulty was used. Cardiovascular response was also assessed using measures of blood pressure and pulse rate. A number of factors were incorporated into the experiment with the aim of increasing sensitivity above that of past research. In particular, the experiment's statistical power was increased using several techniques (e.g., large sample size and a repeated measures design). Also, intermittent exposure was used instead of continuous, and the conditions of exposure were optimised using field parameters specified by parametric resonance theory. To measure performance during exposure, the subjects' task on each of 150 trials was to decide which of two sequentially presented light flashes had the longer duration. The base duration was 50 ms and the alternative durations were 65, 100, or 125 ms. Both reaction time and percentage of correct responses were recorded for each subject. Total exposure time lasted approximately 9 minutes. Blood pressure and pulse were measured for a minimum of 5 minutes, both before and after exposure and sham exposure. The results showed that compared to sham exposure, real exposure decreased reaction time on the hardest level of the performance task. No reliable field-related effects were observed with percentage of correct decisions or the measures of cardiovascular response. The difficulty of making comparisons with similar studies was discussed along with the need for future magnetic field research to be designed with maximum experimental sensitivity in mind given that small effects are likely.

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