

## The impact of traffic noise on mental performance considering complexity of activities

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### Abstract

**Introduction:** Traffic noise has been thought as a major environmental stress in modern societies, and the cause of physiological and psychological disorders according to the World Health Organization. Moreover, traffic noise can interfere with mental performance. However, there is little coherent evidence showing the effect of traffic noise on individuals' performance. Hence, this paper aimed to address the role of traffic noise in participants' mental performance considering the complexity of the activity.

**Material and Method:** Thirty-five master students studying in Tehran University of Medical Science were recruited for this study. Traffic noise was recorded by tape recorder and the traffic noise level was simultaneously measured by sound meter. Then, participants had been separately sitting in silent compared to traffic noise environment before they performed the tests including "S3"-type Choice Reaction Time (CRT) test as a simple activity and "S1"-type Determine Test (DT) as a complex activity taken from "Vienna Test System" software package.

**Result:** The comparison between scores resulted from DT and CRT tests ,before and after exposure to traffic noise under simple activity conditions, showed that there was little increase in mean score of reaction time (P-value=0.47) and motor time (P-value=0.49), showing no statistically significant changes in these variables. On the contrary, following exposure to traffic noise, the DT test under complex activity condition revealed that there is a clear decreasing trend in median reaction time(P=0.001), number of stimuli (P=0.014) and number of reactions (p=0.009) in participants, and also, no significant differences were found in correct responses (P=0.091) and incorrect responses (P=0.073).

**Conclusion:** According to results of this study, use of principles of ergonomic design of signs and training are necessary One of the most significant findings emerged from this study is that traffic noise seems to have no effect on the mentioned variables under simple activity condition. However, traffic noise has devastating effects on median reaction time, number of appeared stimuli and reactions under complex activity condition.

**Key words:** *Traffic noise, Simple activities, Complex activities*

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