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Introduction

Mental fatigue is a multi-dimensional perceptual and cognitive phenomenon interacting with and having impact on different perceptual and cognitive processes [1]. According to recent research evidence, mental fatigue impacts performance of perceptual and cognitive tasks, decreases the quality and increases the amount of errors [2,3,4]. In our study we investigate the impact of mental fatigue on the execution of visual grouping task in general and attentional processes that are implemented while doing it in particular. Visual grouping is usually executed according to different features, for example, colour or shape. The aim of our study is to assess the time for making visual attention task and to explore the correlation between the amount of mistakes and the level of subject's tiredness. Further, we also attempt to assess how a particular part of day (when the test is conducted) influences the performance of grouping task.

Method

Research was conducted by using onscreen grouping task. Subjects did 4 grouping tasks, where the instruction was to find objects with aperture in the same direction. Every task consisted of 10x8 objects. 60 test subjects, between 18 and 32 years old, took part in research. Subjects also answered some general questions about their health and general feeling.

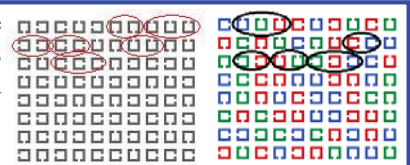


Fig.1. Examples of tests

Results

Results show, that grouping tasks can be completed faster, if there are more than one grouping feature – objects are in the same direction and in the same colours which might be interpreted as a result of additional configurational effects. But grouping task is performed slower if objects in the same direction are in different colours (which might be interpreted as a result of two different competing processes of grouping, i.e., similarity in shape and similarity in colour). Time for task execution more increases for those subjects who feel tired than those who indicated that they feel lively and are not tired. According to our results, the results of the test executed in the evening are the shortest if compared with other daytimes.

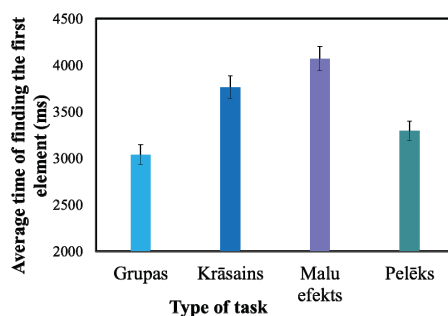
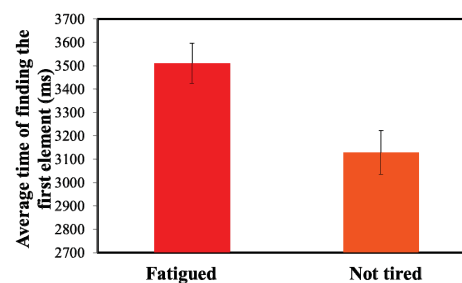


Fig.2. The time of finding the first element in different tasks



3.att. Average time of finding the element depending on the fatigue

Conclusions

Mental fatigue has an impact on visual grouping task. Mentally fatigued subjects need more time to complete the test. The results of our research also shows that the task is faster if conducted in the evening. Impact of the time if the test is conducted in the morning, at day and at night are not statistical significant for the test performance. Finally, according to our results, we can argue that grouping is better if there are more than one feature for grouping (i.e., configurational effects enhance the processes of grouping and attention).

References

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