



BLUR SENSITIVITY AND STIMULUS SIZE

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It is important to increase the knowledge about the blur perception because of its role in the control of accommodation. We wanted to find out the effect of stimulus size on different thresholds of blur sensitivity. Additional factors such as blur adaptation and refraction was included in the study.

We used Landolt rings of two different sizes (5 and 10 arc min) and they were blurred using Gaussian low pass filter. We determined 5 subjective thresholds for 2 refractive groups (emmetropes n=9, myopes n=9). We determined threshold of “just noticeable blur” and “unrecognizable target” (the participant could not correctly determine the direction of the ring) as blur level was increased. Thresholds of “optotype orientation” (the participant notices the direction of irregularity in the blurred spot), “optotype recognition” (the participant could correctly determine the direction of the ring) and “clear image” were determined as blur level was decreased. Additional measurements were done after 30 min adaptation to optical blur (+1,0 D).

Thresholds increase for all blur perception aspects with stimulus size because the effect of the specific blur disc diameter reduces. Results show that the difference between the thresholds of clear image perception and just noticeable blur increases for larger size of the optotype. Statistically significant difference between refractive groups was not observed. Adaptation to additional optical blur increased blur sensitivity by 10 - 48 % according to threshold and refractive group.

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THE IMPACT OF PERCEPTUAL GROUPING ON PERFORMANCE OF CONJUNCTION SEARCH TASK

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According to previous research, analysis of eye movements allows objective, accurate and noninvasive measures (Liversedge et al, 2000) for studying cognitive functions in variety of conditions, central fatigue (Zils et al, 1109-15; Lanthier et al, 2013) including.

The aim of our study is (a) to evaluate the impact of fatigue on the performance of visual search task, and (b) to determine how perceptual grouping by color affects the performance of visual search when eye movements are measured.

Subjects had to perform a conjunction search to determine small groups of equal and contiguous symbols by clicking separately on every symbol that belongs to the group.

Results show that time of task execution decreases in the case when equal symbols (1747±101ms) are grouped according to color and when dark symbols are presented on a white background (1934±114ms).

Conversely the time of visual search task increases when the symbols are randomly colored (2165±127ms) or the borders of the group have a distinct color (2299±134ms). The experiment was conducted at different times of the day, indicating that visual search is less efficient in the morning and further suggesting that the performance of certain perceptual and cognitive processes at least partially depends on the time of the day.

Eye movement analysis shows that in case of symbols grouped according to color the average fixation time tends to decrease (347±19ms) in comparison with randomly colored (359±19ms) or grey (364±17ms) symbols. This can be considered as a partial effect of configuration on the fixation times.

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