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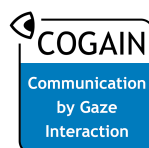
Training saccadic eye movements using visual search task.

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Systematic training of saccades and fixations, using the visual search paradigm, serve as primary help for patients, who have problems with reading control, or have central vision loss and are forced to read using peripheral retina. For this purpose, we are developing a method to train the saccadic eye movements and fixations using a type of visual search task and taking into account the contribution of peripheral visual information. An individual has to find specific letters in the visual search task, where is provided the different kind of peripheral visual information – distractors differ with colour and/or thickness. Moreover, the reading task is used to compare the parameters of eye movements with the ones developed in visual search task. Analysis of the first data reveals that peripheral visual perception significantly affects the spatial parameters of saccadic eye movements, but not the temporal ones ($p<0.05$). Compared to reading, the parameters of eye movements and fixations are similar to the ones in our developed visual search task. The data is to be used in development of method to train the saccadic eye movements and fixations during reading.

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Computerized tests for vergence performance screening at schools

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Using computerized tests to evaluate vergence performance (fusion reserves and vergence facility), it is possible to improve binocular problem screening at schools. To evaluate, which test would be more appropriate for screening, we measured fusion reserves and vergence facility in 65 children (7-17 y.) using classical method (prism bar and $12\triangle$ base out/$3\triangle$ base in) and computerized tests based on random dot (RDS) technique and tranaglyphs. Comparing all three methods, NFR showed no significant difference between methods ($p < 0.05$), but PFR showed significantly smaller average value, measured with tranaglyphs than classical method ($p < 0.001$). Both computerized tests showed good differentiation between subjects with decreased and normal fusion reserves, defining approximate norms of fusion reserves for each age group. By evaluating vergence facility, it was harder for children to keep proper vergence performance stimulated with base out prism, independent of the prism size used (12, 8, 4 pd). Comparing classical and computerized methods, we observed significantly different results ($p < 0.001$). Thus, computerized vergence facility measurement will produce too many vergence problems even among children with good vergence performance. It seems to be easier to perform and to understand fusion reserve tests were RDS stimulus presentation is used.

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