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*Visuospatial attention and reading performance*  
**Skilters, Jakovleva, Ekimane, and Krumina**

Although reading is a uniquely human cognitive activity involving a number of distinct visual responses during which a series of short eye movements – saccades – are performed, approximately 10% of children will experience reading difficulties. This study explores visuospatial attention in children and its role in reading processes.

Empirical data reveals visuospatial attention (TMT test), reading speed, and oculomotor mechanisms (DEM test) in 2671 children (aged 7-18 years). Children who had been identified as having learning difficulties often exhibited results below 1SD, including visuospatial attention below 1 SD in 12% of such children, reading speed below 1 SD in 48%, and eye movements below 1 SD in 29%. Only children who had been diagnosed with learning difficulties comprised the entirety of the 4% of the study participants who exhibited results below 1 SD for all three testing measures: visuospatial attention, reading speed, and eye movements. Good readers had significantly better results in visuospatial attention and eye saccades. The average z-score in reading speed in poor readers with sub par TMT results was significantly worse ( $z=-1,74$ ,  $p=0.05$ ) than in poor readers with good TMT results. We conclude that there are similar cognitive mechanisms involved in visuospatial attention, reading and oculomotor processes, because poor readers also display poor results in attention and generation of saccadic processing. A plausible interpretation of the results of this study indicates a crucial and necessary developmental relationship between visual attention and reading processes.

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*Reading difficulties as a result of weakness in stereopsis*  
**Krumina and Skilters**

Reading is a complex process involving coordination of real time psychological systems associated with vision, oculomotor control, and linguistic processing. Stereoacuity refers to the ability of depth perception from disparate binocular images, a process that further requires coordinated binocular vision and enables efficient text scanning. Adjustment of small-scale visual stimuli is therefore a crucial component of reading (Schotter et al. 2012). A comparative study was conducted to test reading speed, stereo acuity (using TNO (global) stereotest), and visuo-spatial attention (using TMT A and

B). Participants were 2561 school children (age range from 7 to 15, 2358 children from standard schools and 203 from schools where children with learning difficulties are taught). According to our general results children with learning difficulties indicate significantly weaker results in stereopsis perception ( $157 \pm 114$  arc sec) in contrast to children without learning difficulties ( $96 \pm 85$  arc sec,  $p < 0,0001$ ). Differences in stereopsis and reading speed measures can be observed in all age groups. Decreased reading speed, measures indicating slower attentional processes and weaker stereopsis were observed in children with learning difficulties. In case of a weaker ( $\geq 240$  arc sec) or absent stereopsis, reading speed is significantly higher (accordingly  $z = -0,34$  and  $z = -0,22$ ) than in case of good stereopsis ( $z = 0,09$ ,  $p < 0,0001$ ). We conclude that weaker results in stereopsis refer to weaker development of reading skills and learning quality. Our generalization is that stereopsis is a critical small-scale spatial factor that contributes to the quality of learning.