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Voluntary saccadic control in dyslexia

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The role of eye movement control in dyslexia is still unclear. Recent studies, however, confirmed that dyslexics show poor saccadic control in single and sequential target tasks.

In the present study we investigated whether dyslexic subjects are impaired on an antisaccade task requiring saccades against the direction of a stimulus. Altogether, 620 subjects between age 7 and 17 years were classified as dyslexics (N=506) or control subjects (N=114) considering the discrepancy between their intellectual abilities and reading/spelling achievements.

All subjects performed an overlap prosaccade and a gap antisaccade task with 100 trials to each side of stimulation in random order. Variables analyzed were all saccadic reaction time (SRT) of both tasks, and from the antisaccade task the number of errors (prosaccades), of corrected errors and the number of trials where the subjects still missed to reach the side opposite to the stimulus even after two saccades. An analysis of variance was carried out taking into account the development of saccadic behavior with age and the differences between the groups.

The results confirm a age development in saccade control, especially in the voluntary component (a frontal lobe function) for both groups but indicate that the antisaccade task performance as measured by the error and the correction rate is significantly worse in the dyslexic group at ages above 8 years. Up to 50% of the dyslexics performed the antisaccade task 1.5 standard deviations below the mean of the controls.