

# Smooth Pursuit Eye Movements in Children with Developmental Coordination Disorder

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## Abstract

### **Purpose:**

Oculomotor disorders have been noticed in children with developmental coordination disorders (DCD), however their characteristics and specificity has not been studied systematically. The purpose of this study is to study and compare smooth pursuit characteristics in children with and without DCD.

### **Methods:**

Ninety-one children aged 7 to 12 were enrolled; 27 diagnosed with DCD and 64 controls. Motor electro-oculographic recordings were performed with the Metrovision\* apparatus. Horizontal and vertical smooth pursuit were tested. Horizontal and vertical pursuit indices were calculated as the percentage of the recorded time with smooth pursuit. According to distributions, statistical analysis was performed using ANOVA, Mann-Whitney, Fisher's exact test, Spearman's rho (IBM SPSS V19).

### **Results:**

There was no statistically significant difference for age between the two groups ( $p=0.66$ ). In the DCD children group, the horizontal pursuit gain (HPG) ranged from 23% to 100% (mean: 74.35, median: 78.50, standard deviation (SD): 22.68), the vertical pursuit gain (VPG) ranged from 18% to 99% (mean: 51.61, median: 48.50, SD: 23.15) and the HPG/VPG ratio ranged from 0.74 to 3.23 (mean: 1.63, median: 1.46, SD: 0.71). In the control group, the HPG ranged from 40% to 100% (mean: 76.86, median: 77.75, SD: 14.55), the VPG ranged from 35% to 97% (mean: 66.43, median: 65.00 and SD: 15.39) and the HPG/VPG ratio ranged from 0.59 to 2.27 (mean: 1.21, median: 1.15 and SD: 0.30). In both groups, VPG increase was correlated with HPG increase ( $p < 0.01$ ). There was no statistically significant difference for HPG between both groups ( $p = 0.98$ ), but VPG was significantly better in the control group than in the DCD group ( $p < 0.001$ ).

**Conclusions:**

This study is the first to show that vertical smooth pursuit is significantly affected in children with DCD, suggesting that impairment of the ventro-lateral thalamus may exhibit directional modulation during pursuit.

**Keywords:** eye movements: saccades and pursuits • infant vision • neuro-ophthalmology: diagnosis

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