The importance of vision in the control of walking in children

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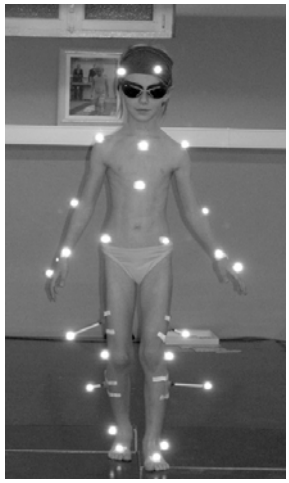
VISUAL CONTROL OF LOCOMOTION

In adults and under normal circumstances, vision is dominant in controlling goal directed locomotion [1]. Little is known on the role of vision in the control of locomotion in growing children. From research regarding postural control, we know there are sensitive periods in development during which absence of vision impaires the control of posture [2].



Are there age – related differences in the effect of visual deprivation on goal directed locomotion?

STUDY DESIGN

- Healthy adults (n = 20, mean age 26.4) and children (n = 40, 3 – 10 years)
- Detailed **biomechanical gait analysis:** Vicon Mcam 60, six cameras, 120 Hz./ Plug – in – Gait ® model/ 27 spationtemporal & kinematic parameters selected
- **Three different situations**: Eyes Open (EO), Restricted Lower Visual Field (RLVF), Eyes Closed (EC)

VISION AFFECTS GAIT DIFFERENTLY IN ADULTS & CHILDREN

- In adults, RLVF had no impact on the gait pattern. Children showed a decrease in walking speed due to a shorter step length.
- The gait pattern of children was more affected by visual deprivation than the gait pattern of adults (Figure 1).

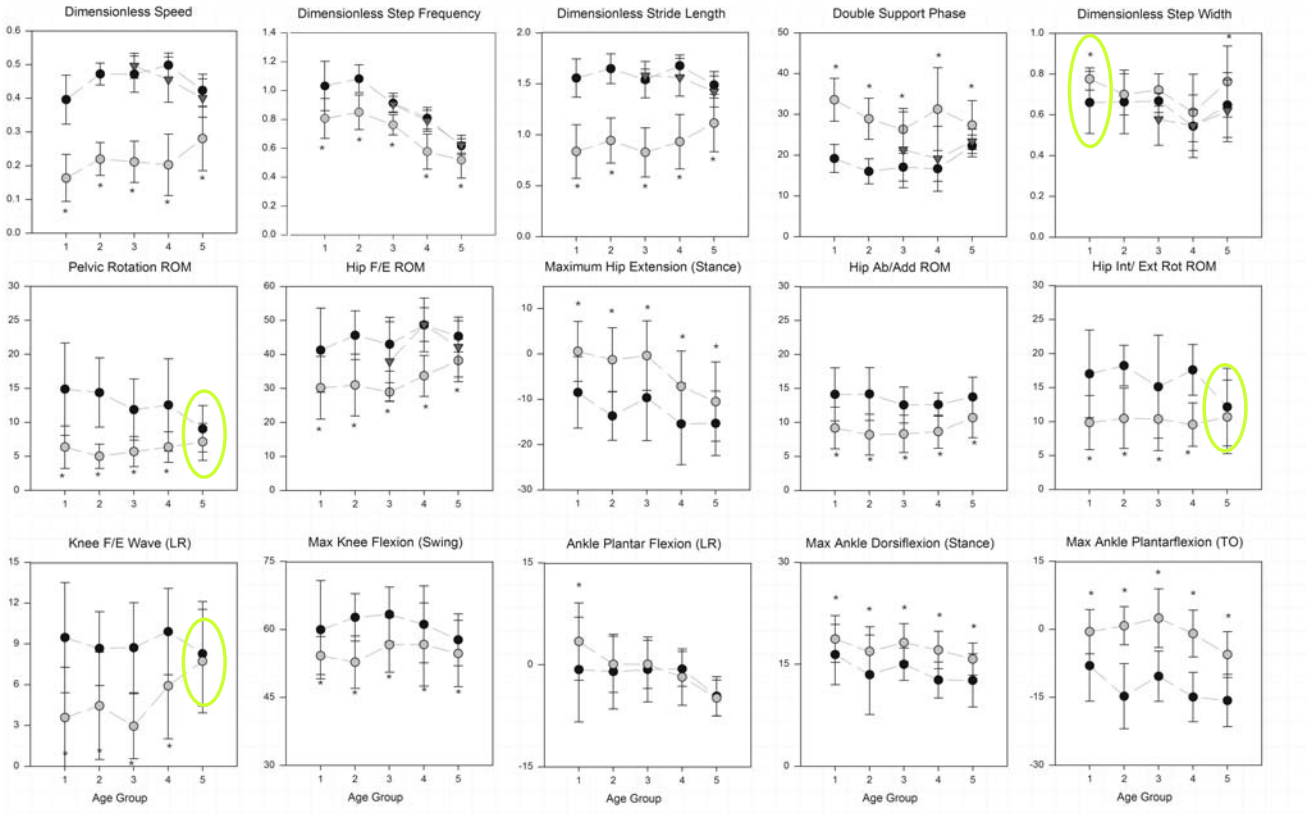


Figure 1: Results from the ANOVA for repeated measures: EO (black circles), RLVF (diamonds) & EC (grey circles) / Age groups: 1 = 3 – 4 y., 2 = 5 – 6 y., 3 = 7 – 8 y., 4 = 9 – 10 y. & 5 = adults / * $p < 0.05$

SPEED EFFECT?

Most differences in kinematic gait parameters that are observed between EO and EC are related to differences in walking speed. After correction for speed, significant differences remain in stride length (EC < EO), step width (EC > EO), maximum hip extension in stance (EC < EO) and knee flexion during loading response (EC < EO).

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