

The Influence of Virtual Reality Optic Flow Stimulation on Postural Control in Children

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PROFESSIONSHØJSKOLEN

METROPOL

Conclusion and take home message

This study examined whether optic flow through immersive virtual reality affects postural control in healthy children. The study concluded:

- that VR optic flow stimulation significantly affects sway velocity in healthy children,
- with further refinement, this testing technique might be a useful tool to screen optical dependence in for subjects with balance pathology.

Background

Virtual reality can help clinicians and researchers to create a synthetic, controlled virtual environment which imitates the complexity of the sensory stimulation found in the physical world. The aim of this study, was to use VR to simulate the moving room paradigm (fig.1) and see whether this form for optical flow sensory stimulation affects postural control in typically developing children.



Fig. 2 Experimental setup

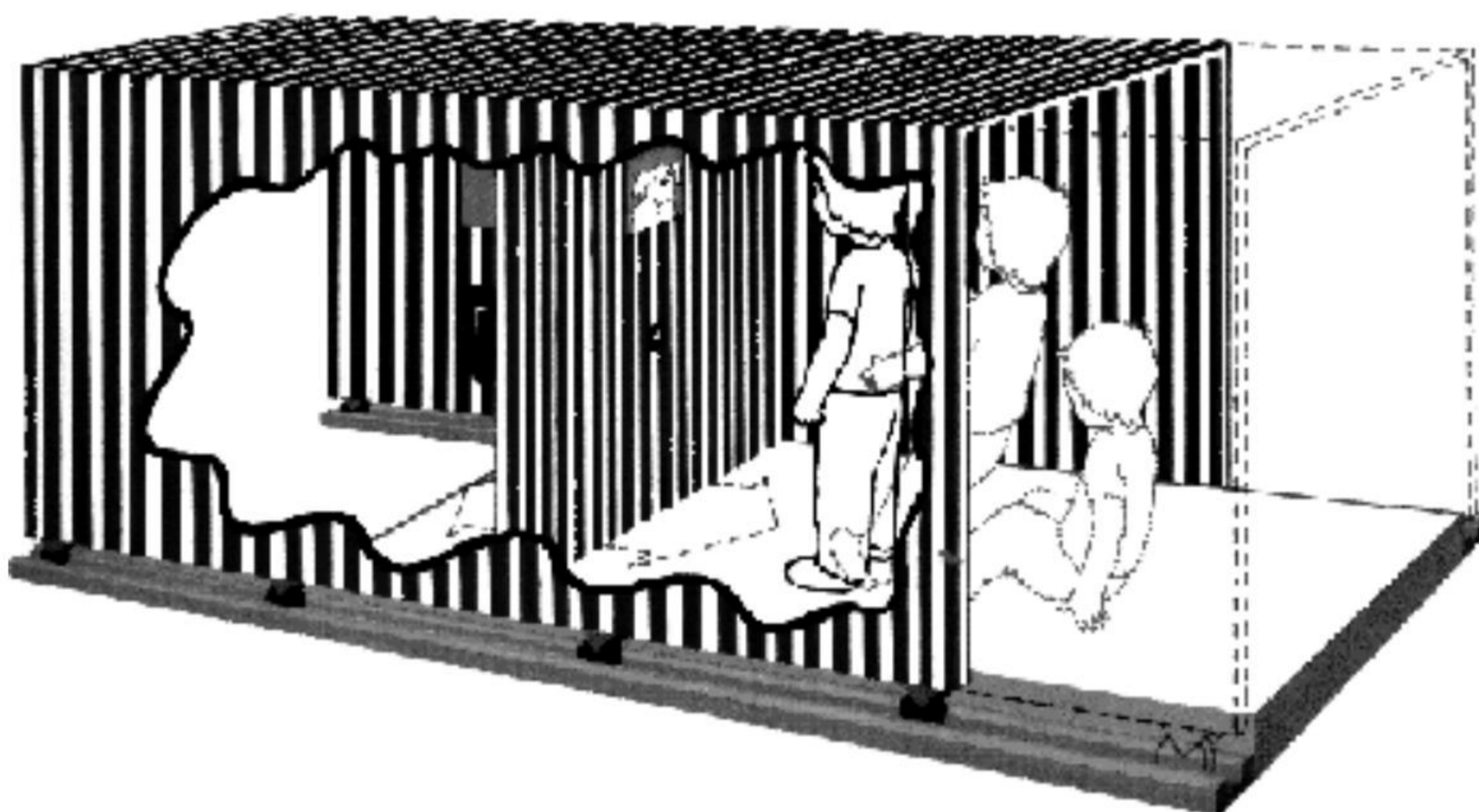


Fig.1 Illustration of the moving room paradigm (D.N. Lee and E. Aronson. Visual proprioceptive control of standing in human infants. *Perception & Psychophysics*, 15:529--532, 1974)

Method

Ten healthy children between 8-12 years participated in the study. Subjects were visually stimulated using VR headset showing a random sequence of virtual movements lasting 2 seconds. Their bipedal standing sway velocity and area were measured using a force plate and compared to control sway measurements measured without visual stimulus.

Results

The study showed that optic flow through VR had a significant effect on sway velocity in anterior-posterior direction ($p=0.02$) compared to controls, while anterior-posterior and medio-lateral range showed higher outcome in control recordings compared to optic flow stimulations ($p=0.004$; $p<0.001$).

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