BOOK OF ABSTRACTS

29th Annual Congress of the

EUROPEAN COLLEGE OF SPORT SCIENCE

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Hosted by the University of the West of Scotland

Edited by: Davison, R.C.R., Tsolakidis, E., Thompson, J.L., Ferrauti, A., Piacentini, M.F.

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kinematics during the swing phase of recovery steps (tripping task) or crossing leg (obstacle crossing task) were compared between virtual and physical conditions using statistical parametric mapping. Performances and adaptations in locomotor safety and effectiveness were analysed by using the margin of stability (MoS; tripping) and toe clearance (obstacle crossing).

RESULTS: Repeated exercise of visually induced tripping as well as obstacle simulations led to adaptive changes in lower extremity joint kinematics and enhanced performances, i.e. MoS increased on average by 5cm in TRP ($p<0.05$), and toe clearance decreased by 4.7cm in OBS ($p<0.001$).

During subsequent mechanically induced tripping, the TRP group revealed a higher MoS compared to controls ($p<0.05$), with no decline one week later. In contrast, the OBS group crossed physical obstacles with a lower toe clearance compared to controls but revealed significantly higher values compared to the VR condition ($p<0.01$).

CONCLUSION: This studys findings indicate that adaptive changes in locomotor safety and effectiveness enhanced through repeated visual gait perturbations in virtual reality can partly be transferred and retained in physical scenarios. However, transferability appears to be constrained when navigating obstacles during walking, which may stem from a discrepancy in visual perception and motor response between virtual and physical environments. (1) Janeh & Steinicke, 2021, Front Hum Neurosci

INTERSESSION RELIABILITY OF A COMPUTERIZED EYE-HAND COORDINATION TEST

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INTRODUCTION: Computerized wobble boards (WB) offer a novel method for assessing dynamic balance in the lower limbs, providing the advantage of evaluations outside the traditional laboratory settings. Although the reliability and validity of these devices in evaluating lower limb balance have been well documented, their potential for assessing eye-hand motor coordination remains unexplored. In order to address this gap in the literature, our study aimed to establish the intersession reliability of WB assessments for eye-hand motor coordination in young healthy subjects.

METHODS: 53 subjects (age:24.8±2.7years; body mass:67.7±13.3kg; height:169.8±9.5cm) were evaluated across two sessions separated by a 48-hour rest period. A custom software connected to a laptop for the WB test, displaying real-time performance on a monitor, was used. The software setup included a Motion Marker (MM) and a Target Zone (TZ). Subjects performed four 15-second trials for each limb, with a 30-second recovery period between trials. During the trials, the tested limb was positioned at a 90° on the WB. Subjects were instructed to move the MM in various predefined patterns (clockwise (C), counterclockwise (CC), antero-posterior (AP), medial-lateral (ML)) on the screen, aiming to maintain it within the TZ for as long as possible while standing. Times (s) for the dominant and non dominant limbs under each condition were recorded. The intersession reliability was assessed using Intraclass Correlation Coefficient (ICC), Standard Error of Measurement (SEM), and 95% Minimal Detectable Change (MDC95).

RESULTS: Results revealed good to excellent intersession reliability for dominant limb (ICC range:0.62-0.80; SEM range:1.15–1.77), except in the AP condition (ICC=0.52), and for non dominant limb (ICC range:0.72–0.78; SEM range:0.96–2.14), except in the ML condition (ICC=0.62). For the dominant limb, MDC95 ranged from 2.28 to 3.03, whereas for the non dominant ranged from 1.90 to 4.25.

CONCLUSION: Findings shows the reliability of WB eye-hand motor coordination assessments, crucial for tasks requiring complex movement patterns. The low SEM highlights precision, while differences in MDC95 shows different sensitivity to performance changes across limbs and conditions. The dominant limb smaller MDC95 values shows a greater ability to detect performance changes, critical for adapting athletic training, especially in sports like basketball where such coordination is crucial. The results might allow coaches to adapt training to enhance weaker areas, mainly in the non dominant limb, improving overall performance in skills like dribbling. Beyond sports, WB testing might uncover eye-hand coordination deficits in students, suggesting adjustments in eye-hand training and lecture strategies to increase cognitive skills such as attention and memory, thus enhancing focus and note-taking. This highlights WB evaluations role in adapting athletic and academic approaches, addressing specific needs to optimize physical and cognitive development.

Oral Presentations

OP-AP37 Track and field

SPATIOTEMPORAL ANALYSIS OF 289 WORLD-CLASS 400-METER RUNNING PERFORMANCES

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INTRODUCTION: Sprint running performance is the product of the spatiotemporal variables step frequency [SF] and length [SL].[1] While the 100-m dash has been in the spotlight of biomechanical investigations, less research has looked at the 400-m distance. Hence, purpose of this study was to extract spatiotemporal parameters from a large sample of world-class 400-m performances and gain insights on potential determining factors.