Vereniging voor Bewegings- en Sportwetenschappen

Association for Movement and Sports Sciences

29th VBSW Symposium

6 December 2024

Brussel

Editor: Prof. Eva D'Hondt

FOREWORD

Dear fellow movement and sports scientists,

After a successful edition in Ghent last year, we are very pleased to welcome you all at the main campus of the Vrije Universiteit Brussel for the 29th edition of our annual symposium of the Association for Movement and Sports Sciences.

As appointed new president, I take over the torch from my colleague Prof. Jan Boone (UGent), who is now joining Prof. Martine Thomis (KU Leuven) as past-president of our association. To thank both of them for their years of commitment as enthusiastic VBSW board members, I believe they deserve the very first round of heartfelt applause. The same applies to the local team of organizing and supporting staff. We really appreciate everyone's help to make today's event possible together.

Hopefully you are also already experiencing the positive and constructive atmosphere in view of the vibrant conference day ahead of us! In addition to inviting 2 distinguished keynote speakers, our symposium aims to let young and promising researchers take the stage. To this end, 12 PhD students were selected to orally present their scientific work in this auditorium here today. Another number of PhD and Master students will give their best with a poster presentation during the midday session in the Nelson Mandela Room. For many of them, it is the first time to disseminate their research and associated findings to a broader audience. All these presenters can participate in the competition for the Gaston Beunen Award, but allow me to quote Nelson Mandela's words in this regard: "You never lose. You either win or learn".

So, let us all learn from one another and focus on promoting positive feedback and a lot of pleasant in-person interactions. Please make use of this meeting to get in touch with each other and to share research experience beyond university boundaries during the actual sessions, the more informal coffee and lunch breaks as well as the closing reception. With 115 passionate attendees, this should work out just fine. 😉

Enjoy your day as we move through the interesting program altogether!

Prof. Eva D'Hondt (VUB)

President of the Association for Movement and Sports Sciences

PROGRAM - 29th VBSW Symposium 06/12/2024 in Brussels

08u15 – 09u00	**Registration** at VUB Main Campus – Gebouw Q – Pleinlaan 2 – 1050 Brussel	*Nelson Mandela Room*
08u30 – 09u00	**Poster installation**	*Nelson Mandela Room*
09u00 – 09u10	**Welcome** by Prof. Eva D'Hondt (VBSW President)	*Aula Q.D*
09u10 – 09u50	**KEYNOTE 1 - Prof. Bruno Tassignon** (UHasselt, BEL) *Sports ligament injuries and the brain*	*Aula Q.D*
09u50 – 10u50	**Oral presentations – Part 1 (Gaston Beunen Award)** 09u50-10u05 **Luna Van der Steen** (VUB) *A comparative analysis of sports event hosting policies in 17 European countries* 10u05-10u20 **Arne Bouten** (UGent) *Enhancing teachers' motivating style through an online video annotation tool: A cluster-randomized trial* 10u20-10u35 **Wouter Timmerman** (Edith Cowan University & KU Leuven) *Exponentially increase the chance of success: Athlete monitoring perspectives of world-class endurance sport coaches* 10u35-10u50 **Lore Daelman** (VUB & UGent) *A systematic review of social and physical home environmental factors associated with motor competence in typically developing toddlers*	*Aula Q.D*
10u50 – 11u15	**Coffee Break**	*Nelson Mandela Room*
11u15 – 12u15	**Oral presentations – Part 2 (Gaston Beunen Award)** 11u15-11u30 **Jelle Habay** (VUB) *It is not as simple as it seems: An experimental investigation of the effect of mental fatigue on physical performance featuring over 100 participants* 11u30-11u45 **Laure Haenebalcke** (UGent & Loughborough University) *Associations of device measured physical activity with appetite perceptions and appetite-related hormones in healthy adults* 11u45-12u00 **Pieter-Jan Marent** (KU Leuven & UGent) *Associations of 24-hour movement behaviours and cognitive function in older adults: A compositional data analysis* 12u00-12u15 **Matteo Vanroose** (VUB) *Reliability of the lateral jump-landing test, a new screening test for athletes with an anterior cruciate ligament reconstruction at return to play*	*Aula Q.D*

12u15 – 12u45	**Lunch**	*Nelson Mandela Room*
12u45 – 13u45	**Poster presentations (incl. Gaston Beunen Awards for posters)**	*Nelson Mandela Room*

PhD students (N = 4)
Liese Bosman (VUB)
Otis Brouwers (UGent)
Kim Cnudde (UGent)
Ben Goedons (UGent)

Post-Doc (N = 1)
Sanne Stegen (UGent)

Master students (N = 15)
Maud De Geest (KU Leuven)
Tijs Ferson (KU Leuven)
Ruben Hillewaere (KU Leven)
Mats Leemans (VUB)
Eben Robijns & Dries De Brabander (KU Leuven)
Nele TerLaeken (KU Leuven)
Glenn Van Herpe (UGent)
Maxine Vanhove & Lien Van Renterghem (VUB)
Noor Veranneman (KU Leuven)
Nathan Vermaerke & Siemon Vermeiren (KU Leuven)
Freya Biets & Kaat Gouwy (KU Leuven)
Arthur Brabant (KU Leuven)
Emre Erdogan (VUB)
Yoram Müller-Jabusch & Anton Olieslagers (KU Leuven)
Jasper Nica & Lars De Vos (VUB)

13u45 – 14u25	**KEYNOTE 2 – Prof. Sylvain Laborde** (GSU Cologne, GER) *Heart rate variability in sport: Enhancing performance and well-being listening to heart-brain conversations*	*Aula Q.D*
14u25 – 15u25	**Oral presentations – Part 3 (Gaston Beunen Award)**	*Aula Q.D*

14u25-14u40 **Joachim D'Hondt** (VUB)
Is there an association between lower inter-limb asymmetry and performance-related metrics in middle- and long-distance runners? A systematic review
14u40-14u55 **Kaat Vanderbeke** (KU Leuven)
Rimonabant treatment modulates skeletal muscle responses following immobilization in young and sarcopenic, old mice
14u55-15u10 **Lisa Mertens** (VUB & UGent)
Motor, cognitive and socio-emotional baseline predictors of change in motor competence over a six-month period in 1- to 3-year-old toddlers
15u10-15u25 **Kari Descheemaeker** (VUB)
Key policy characteristics in youth athletic pathways: A comparative case study across sports

15u25 – 15u30	**Public Voting (Audience Award)**	*Aula Q.D*
15u30 – 15u50	**General Assembly Meeting & Acknowledgements** by Prof. Eva D'Hondt (VBSW President)	*Aula Q.D*
15u50 – 16u10	**Gaston Beunen Award & Audience Award Ceremony** Oral presentations PhD students / Poster presentations PhD students / Poster presentations Master students	*Aula Q.D*
16u10 – …	**Closing Reception**	*Nelson Mandela Room*

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PhD students – Oral presentations
Gaston Beunen Award

All young researchers who have not yet defended their PhD thesis can participate in this oral presentation competition. The jury selected a maximum of twelve oral presentations in advance from the submitted abstracts. The candidates are given ten minutes to present their work, after which the jury can ask questions for five minutes. The 1st place winner of this competition will receive a cash prize of 150 euros, while the 2nd and 3rd ranked PhD students will be proclaimed.

This year the following PhD students were selected to present their work:

* in order of appearance *

Part 1

09u50-10u05: Van der Steen Luna (VUB)

10u05-10u20: Bouten Arne (UGent)

10u20-10u35: Timmerman Wouter (KU Leuven & Edith Cowan University)

10u35-10u50: Daelman Lore (VUB & UGent)

Part 2

11u15-11u30: Habay Jelle (VUB)

11u30-11u45: Haenebalcke Laure (UGent & Loughborough University)

11u45-12u00: Marent Pieter-Jan (KU Leuven & UGent)

12u00-12u15: Vanroose Matteo (VUB)

Part 3

14u25-14u40: D'Hondt Joachim (VUB)

14u40-14u55: Vanderbeke Kaat (UGent)

14u55-15u10: Mertens Lisa (VUB & UGent)

15u10-15u25: Descheemaeker Kari (VUB)

Click on each of the links above to go directly to the corresponding abstract.

A comparative analysis of sports event hosting policies in 17 European countries

Van der Steen Luna[1], Derom Inge[1], Van Hoecke Jo[1], Taks Marijke[2]

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Introduction: As bid processes become more complex, governments are regulating selection criteria, funding guidelines, and stakeholder roles. These elements are part of the sports event hosting policy framework that covers policy process (context and stakeholders), content (eligibility, funding criteria, and event types) and outcomes (strategic goals and impacts). The research questions are: (1) To what extent are sports event hosting policies developed? (2) Why do countries host major sports events? and (3) Which topics are predominantly discussed regarding policy process and content?

Methods: This study employs a qualitative document analysis of 34 policy documents from 17 European countries. Policy and strategy documents for hosting major sports events were systematically searched for in the public domain. A deductive-inductive coding approach was used to categorize data, resulting in a unified framework across countries.

Results: Of the 17 countries studied, 10 had well-developed sports event hosting policies. Countries with dedicated event hosting policies present stronger frameworks, while those embedding sports events in broader policies (e.g., tourism) are less detailed (RQ1). The main reasons for hosting are to gain social, reputational, tourism, and economic benefits. Dedicated hosting policies include objectives such as enhancing sport development and participation, while countries without a formal strategy focus more on image and tourism (RQ2). Policymaking often considers factors like eligibility and impact to align events with resources, however, implementation tools remain limited (RQ3).

Conclusion: The findings show that not all governments have a dedicated sports event hosting policy, and not all policies are developed to the same extent. A comparative analysis highlights gaps and best practices, while the proposed framework offers a guide for policymakers to refine and align their strategies. Not all countries are sharing their strategies transparently. As a result, some countries may be further along than their policy documents reveal.

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Enhancing teachers' motivating style through an online video annotation tool: A cluster-randomized trial

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Introduction: Enhancing teachers' motivating style is crucial for their well-being and their students' engagement. Traditional workshop-based interventions, while effective, face challenges in scalability and sustainability. This cluster-randomized trial evaluated an online video annotation tool designed to improve physical education (PE) teachers' motivating style through self-reflection. The tool allows teachers to analyze their teaching practices using structured annotations based on Self-Determination Theory.

Methods: Schools (N = 47) were randomly assigned to intervention or control groups. Participants included 76 secondary PE teachers (mean age 38.53 years; 41.9% women) and 562 students (mean age 15.26 years; 59.7% girls). Intervention group teachers (N = 39) used the online tool for 1-2 hours on average, while control group teachers (N = 37) received a generic email on motivating teaching. Teaching styles (autonomy support, structure, control, chaos) were assessed pre- and post-intervention using teacher self-reports, student perceptions, and observer ratings. Repeated measures ANOVAs analyzed teacher and observer data, while mixed-effect models were used for student ratings. The average interval between assessments was three months.

Results: Complete case analyses, including all 76 teachers (39 intervention, 37 control), revealed a significant interaction effect (time*condition) for teacher-reported autonomy support ($F = 4.37$, $p = .040$), with the intervention group showing a greater increase than the control group. Per-protocol analyses, focusing on 67 teachers (30 intervention, 37 control) who completed the study as intended, found a significant interaction effect for observer-rated autonomy support ($F = 4.86$, $p = .031$), favoring the intervention group. No significant effects were found for structure, control, chaos, or student-perceived teaching styles.

Conclusion: The results demonstrate the online tool's potential to enhance teachers' autonomy support based on self-reports and observer ratings, offering a viable alternative to traditional workshops. However, further research is needed to optimize the tool's effectiveness.

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Exponentially increase the chance of success: Athlete monitoring perspectives of world-class endurance sports coaches

Timmerman Wouter[1,2], Raynor Annette [1], Abbiss Chris[1], Lawler Nathan[3], Stanley Mandy[1]

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Introduction: There is limited research on athlete monitoring perspectives of world-class coaches in endurance sports. Although successful athlete monitoring will be context-dependent, a deeper understanding of world-class endurance sports coaches' athlete monitoring perspectives might provide insights and direction for coaches, practitioners, and athletes. Therefore, this study aimed to describe and explore the athlete monitoring perspectives of world-class endurance sports coaches across various endurance sporting disciplines.

Methods: A qualitative descriptive design with reflexive thematic analysis according to Braun & Clarke (2022) was employed. Twelve world-class coaches, who coached athletes who medalled at major senior championships (i.e., Olympic Games, Commonwealth Games, and World Championships) or cycling Grand Tour general classification, participated in a semi-structured interview (78 ± 9 min).

Results: Four themes were generated: "Bringing the best out of the athlete", "The central role of relationships and communication in coaching and athlete monitoring", "Pursuing learning and understanding", and "Dynamic and responsive decision-making to athlete monitoring information". The analysis highlighted that the coaches view athlete monitoring as all-encompassing and holding a valuable role in enhancing athlete performance. Athlete monitoring helps to bring out the best in athletes, substantially contributes to both coach and athlete learning and understanding, and informs decision-making. The coaches achieve this by balancing objective, quantified subjective and non-quantified subjective athlete monitoring information while focusing on developing a strong coach-athlete relationship and open communication to enable and facilitate effective athlete monitoring.

Conclusion: World-class endurance sports coaches emphasise that athlete monitoring is a versatile tool complementing the art of coaching and supporting the learning and decision-making processes. The coaches stressed the importance of balancing multiple data sources, contextualising data to avoid misinterpretation, and not overreacting to athlete monitoring data. While athlete monitoring should not be seen as the holy grail and does not guarantee success, it can substantially contribute towards achieving success.

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A systematic review of social and physical home environmental factors associated with motor competence in typically developing toddlers

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Introduction: Motor competence (MC) plays a key role in toddlers' holistic development. MC is also key for cultivating an active and healthy lifestyle, and is considered a foundational precursor to more advanced movement patterns and sport-specific skills. However, recent evidence indicated that MC development is delayed in 1- to 3-years-olds. The etiology of a child's MC can be attributed to cumulative interactions and exposures with the environment, both stimulating and hindering. Since the home environment is very influential during early childhood, this systematic review aims to identify the social and physical environmental factors at home associated with toddlers' MC.

Methods: This registered review (CRD42024501137) follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Five databases were searched: PubMed, Embase, Web of Science, Education Resources Information Center and Cumulative Index to Nursing and Allied Health Literature. After conducting the systematic search, 4890 original research articles were retrieved, of which 59 could be included after duplicate removal and screening. Their methodological quality was determined using the Quality Assessment Tool for Quantitative Studies.

Results: Two studies found that the overall physical home environment is positively associated with MC (n=2, β[0.19-6.74], p<0.01), 4 articles specifically examined 'toys' (n=4, (r=4.47, p<0.01) & (β[0.06-1.38], p<0.05)). Regarding the social environment at home, parental education and parenting behaviors showed a positive association with MC (n=5 (r=0.071, p<0.01) & (β[0.04-4.90], p<0.05)) and (n=4, (r[0.31-0.37], p<0.05) & (β[0.14-0.47], p<0.01)), whereas parental age was not associated with MC (n=5). For other social environmental factors findings were rather inconsistent.

Conclusion: This systematic review identifies important stimulating and hindering factors, both inherent but also modifiable, related to the social and physical home environment to be associated with toddlers' MC. These findings may help developing future home-oriented intervention components to counteract the general decline in MC levels among toddlers.

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It is not as simple as it seems: An experimental investigation of the effect of mental fatigue on physical performance featuring over 100 participants

Habay Jelle[1, 2, 3], Arenales Laurisa[1], Schampheleer Emilie[1], Pattyn Nathalie[2], Van Cutsem Jeroen[2], Roelands Bart[1, 4]

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Introduction: Mental fatigue (MF) is defined as a psychobiological state that arises after a period of prolonged demanding cognitive activity. Different studies propose that MF has a negative effect on physical performance, but recent insights contest this idea. The present investigation aims to answer whether MF truly impacts physical performance, using a rigorous design and high quality research methods.

Methods: 117 participants (57♀, 32.22±8.59y, 22.64±2.63kg/m^2, 47.69±9.39ml/min/kg) were included in this randomized crossover trial, consisting of a familiarization, intervention and control visit. MF was induced using a 45 minute Stroop task, while the control condition consisted of a documentary of the same duration. The level of MF was checked using a visual analogue scale (MVAS) and a GoNoGo task. Physical performance was assessed using a 15 minute cycling time trial. Secondary outcomes were physical fatigue (PVAS), rate of perceived exertion (RPE), lactate, blood glucose, motivation (MotiVAS) and mental demand (NASA-TLX). Paired sample t-tests and ANOVAs were used for analysis.

Results: There was an increase in the subjective level of MF over time ($p<0.001$; $\eta_p^2=0.004$) and between conditions ($p<0.001$; $\eta_p^2=0.08$). Similarly, the GoNoGo task showed a decrease in performance over time ($p<0.001$; $\eta_p^2=0.07$) and between conditions ($p<0.001$; $\eta_p^2=0.06$). A trend towards significance was found regarding the influence of MF on time trial distance ($p=0.062$; $d=0.194$). While there was no significant effect of MF on RPE ($p>0.05$), PVAS values were higher because of MF ($p=0.047$; $\eta_p^2=0.01$). There was no effect of MF on motivation, mental demand, blood glucose and lactate variables during the time trial ($p>0.05$).

Conclusion: The present study shows a clear effect of MF on cognitive performance and subjective variables, with a less clear but existing effect on physical performance (−200m). Future research should focus on the mechanisms by which MF affects physical performance, while taking into account interindividual variability.

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Associations of device measured physical activity with appetite perceptions and appetite-related hormones in healthy adults

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Introduction: Single bouts of exercise can alter appetite perceptions and appetite-regulating hormones. However, less is known about how habitual physical activity is related to these outcomes. This study explored independent associations of objectively measured physical activity with appetite perception and circulating concentrations of appetite-related hormones in healthy adults.

Methods: Ninety-nine healthy participants (47 females, 52 males; median age 25.0 (10.0) years; median BMI 23.5 (4.4) kg/m^2) completed a 3h mixed-meal tolerance test with appetite perception (hunger, fullness, and satiety) assessed at 30 min intervals using visual analog scales. Venous blood samples were collected in a fasted state (leptin) and at 30-, 60- and 120-minutes post-meal (acylated ghrelin and protein YY). Physical activity was measured over seven days with a wrist-worn accelerometer (GENEActiv 3.3). Generalized linear models, adjusted for age, sex, ethnicity and BMI, were used to explore associations between moderate-to-vigorous physical activity (MVPA) and the appetite outcomes.

Results: In the final adjusted models, MVPA was positively associated with satiety (ß=24.1 [6.6 – 41.6]; p=0.007); but no significant associations were found for MVPA with hunger and fullness (ß=9.6 [-9.7 – 28.8], p=0.329 and ß=-14.5 [31.5 – 2.5], p=0.095) respectively). Furthermore, there were no associations between MVPA and post-prandial protein YY, acetylated ghrelin, and fasted leptin concentrations (ß=-3.6 [-26.0 – 18.8], p=0.750; ß=3.9 [-4.2 – 12.0], p=0.350 and ß=11.7 [-27.6 – 4.2], p=0.150).

Conclusion: These findings suggest that moderate to vigorous physical activity may be related to the increased satiety perception. The mechanisms mediating this association require further investigation.

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Associations of 24-hour movement behaviours and cognitive function in older adults: A compositional data analysis

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Introduction: Global life expectancy has consistently increased since 1950, resulting in more people living to an older age. However, maintaining optimal cognitive health is a challenge as ageing is accompanied by natural cognitive decline, which can affect daily functioning and quality of life. Fortunately, modifiable lifestyle factors can play a role in promoting healthy ageing. This study investigates how the 24-hour movement behaviours – physical activity (PA), sedentary behaviour (SB) and sleep – relate to cognitive function in older adults.

Methods: In total, 233 healthy adults aged 55 and older participated in this study (50.9% women; mean age 68.3 ± 7.7 years). Participants wore the wrist-worn ActiGraph wGT3X-BT for seven consecutive days to capture their time-use in light PA (LPA), moderate-to-vigorous PA (MVPA), SB and sleep. Cognitive function, including executive function (EF), processing speed, short-term and long-term memory (STM, LTM), was assessed using the Cambridge Neuropsychological Test Automated Battery. Compositional multiple linear regression was performed to assess the associations between cognition and time-use. Compositional isotemporal substitution then examined the effect of time reallocations between the different movement behaviours on the cognitive outcomes.

Results: Even after adjusting for age, sex, educational level and social isolation, time-use was significantly associated with short-term memory ($p<0.01$) and executive function ($p<0.001$). Hypothetical time reallocations of 30-min from LPA to MVPA predicted the largest improved z-scores, namely 0.19 [0.05-0.32] in STM and 0.22 [0.10-0.34] in EF. Similarly, reallocating 30-min from LPA to SB improved EF z-score with 0.14 [0.07-0.21]. No associations were observed for processing speed and long-term memory.

Conclusion: This study underscores the importance of the 24-hour movement behaviours in cognitive health. Dedicating more time to moderate-to-vigorous PA seems to be beneficial for specific cognitive domains. However, longitudinal studies are needed to further explore these relationships, with a focus on detailed assessments of sedentary behaviour types.

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Reliability of the lateral jump-landing test, a new screening test for athletes with an anterior cruciate ligament reconstruction at return to play

Vanroose Matteo[1,2,3], Carpentier Chloë[3], Van Loock Anke[3], Corthouts Romina[3], Beckwee David[3], Vanlauwe Johan[5], Buyl Ronald[4], van Melick Nicky[6], Eechaute Christophe[3]

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Introduction: Anterior cruciate ligament (ACL) injuries are serious sports injuries with an incidence rate of 1.51/10 000 and causing a considerable socio-economic burden. Athletes with an anterior cruciate ligament reconstruction (ACLR) have a 4-6 times higher risk to develop osteoarthritis. Further on, up to 21% of athletes with an ACLR sustain a reinjury. Therefore, screening athletes at risk for a recurrent ACL injury is important. At present, hop-tests have insufficient predictive validity because they lack sport specific elements. Therefore, the purpose of this study is to develop the lateral jump landing test (LJLT) and evaluate its reliability.

Methods: At return to play (RTP), athletes with an ACLR performed the LJLT twice, with a one-week time interval. Participants jumped laterally over a hurdle, landed on the other leg and tried to keep balance. The LJLT was also performed using a dual task. Balance was evaluated by scoring the number of Change-in-Support Strategy (CSS) errors, using 2D video analysis. For the evaluation of test-retest reliability, Intraclass correlation (ICC) coefficients and standard errors of measurements were calculated. For the assessment of the interrater reliability, ICCs and Cohen's Kappa coefficients were used.

Results: For test-retest reliability, ICC coefficients of the sum scores were .70 or higher, except for the non-operated leg with dual task [ICC = .49]. The SEM ranged between 1.7 and 2.7 errors. For the interrater reliability, ICCs were .90 or higher and Kappa coefficients ranged between .50 and 1. Results demonstrate that the LJLT can discriminate athletes with a good balance from those with a poor balance. The LJLT with dual task demonstrated greater variability and is significantly more difficult.

Conclusion: The LJLT demonstrates sufficient test-retest- and interrater reliability.

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Is there an association between lower inter-limb asymmetry and performance-related metrics in middle- and long-distance runners? A systematic review

D'Hondt Joachim[1], Chapelle Laurent[1], Bishop Chris[2], Aerenhouts Dirk[1], De Pauw Kevin[3], Clarys Peter[1], D'Hondt Eva[1]

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Introduction: The presence of inter-limb asymmetry in the human body has traditionally been perceived to be detrimental for athletic performance. However, the current literature on the association between lower-limb asymmetry and performance metrics in middle- and long-distance runners is scarce and inconsistent. This systematic review aims to synthesize existing evidence on the relationship between lower inter-limb functional, morphologic, kinetic and kinematic asymmetry and performance-related metrics in male and female healthy adult middle- and long-distance runners.

Methods: The scientific databases Pubmed, Web of Science and SPORTDiscus were systematically searched following the "Preferred Reporting Items for Systematic Reviews and Meta-analyses" (PRISMA) guidelines for studies investigating the relationship between lower inter-limb asymmetry and performance-related metrics in healthy adult middle- and long-distance runners of any sex and training level. The quality of included studies was assessed using the Downs and Black Quality Index Tool.

Results: Out of 4817 articles screened in total, 8 studies were included reporting on functional, morphological, kinematic and kinetic asymmetry at lower inter-limb level associated with running performance-related metrics (i.e., running velocity, personal best times, caloric unit cost, metabolic power, mechanical efficiency and metabolic cost). The quality score of the included research varied between 5/10 and 9/10. Our results revealed mixed findings, showing both significant negative (n = 16) and positive (n = 1) associations as well as no significant associations (n = 30).

Conclusion: A high heterogeneity across study methods and outcomes was apparent, making it difficult to draw a straightforward conclusion. Our results indicate that the majority of functional, morphological, kinematic and kinetic inter-limb asymmetry metrics are negatively or not associated with running performance-related metrics. Thus, more extensive high-quality research using standardised asymmetry magnitude metrics is essential to determine whether, and to what extent, inter-limb asymmetry between the lower limbs could affect middle- and long-distance running performance.

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Rimonabant treatment modulates skeletal muscle responses following immobilization in young and sarcopenic, old mice

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Introduction: Skeletal muscle tissue is a highly plastic tissue, important for locomotion and metabolic health. During immobilization (e.g. hospitalization), which often occurs in sarcopenic patients, skeletal muscle homeostasis is disturbed, resulting in muscle atrophy. Currently, no treatment to reverse this immobilization-induced atrophy exists, which is why novel therapeutic strategies are needed. Recent studies show that cannabinoid receptor 1 (CB1) is a key player of muscle plasticity. However, its role during muscle disuse atrophy remains unknown. Therefore, we investigated the effect of CB1 antagonist Rimonabant on muscle responses following immobilization in young and sarcopenic mice.

Methods: The left hindlimb of 16 young and 17 sarcopenic old male C57BL/6 mice was immobilized for five days. Mice were daily intraperitoneally injected with either Rimonabant (RIM) or saline (VEH) and sacrificed after five days. Western blot analyses were performed on the m. gastrocnemius.

Results: In VEH, immobilization induced weight loss of the m. gastrocnemius, to a larger extent in young vs. sarcopenic mice (young: -14.3%, old: -9.1%; p=0.0084). Interestingly, in RIM, this immobilization-induced muscle atrophy was attenuated in both young (-10.4%) and sarcopenic (-5.6%) mice (p=0.0336). Surprisingly, Rimonabant treatment amplified the decrease in muscle protein synthesis in the immobilized leg (RIM: -45.8%, VEH: -27%; p=0.0180). This effect was also more pronounced in young vs. sarcopenic mice (p=0.0005). Despite its protective effect on muscle loss, Rimonabant did not affect the immobilization-induced increase in anabolic (p-S6rp, p-4E-BP1), autophagy (LC3b-II/I, p62), or ubiquitin-proteasome (MAFbx) markers.

Conclusion: Rimonabant attenuated muscle weight loss and muscle protein synthesis during immobilization, surprisingly, without affecting skeletal muscle anabolic and catabolic pathways. The exact pathway through which Rimonabant attenuates muscle disuse atrophy remains unclear. Therefore, further research is needed to identify the underlying mechanisms responsible for this observation.

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Motor, cognitive and socio-emotional baseline predictors of change in motor competence over a six-month period in 1- to 3-year-old toddlers

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Introduction: Early childhood is a critical period of rapid overall development. Motor competence (MC) is essential for performing daily activities, yet its development remains underexplored in 1- to 3-year-olds. This study examined to what extent baseline MC, cognitive functioning (CF) and socio-emotional functioning (SEF) predict change in MC.

Methods: In group childcare centres, 90 toddlers' MC was assessed at baseline (T0) and six months later (T1) using the Peabody Developmental Motor Scales, 2nd Edition (PDMS-2). Baseline CF and SEF were measured using the Bayley Scales of Infant and Toddler Development, 4th Edition (Bayley-IV). MC was expressed as the age-corrected Total Motor Quotient (TMQ), calculated from the PDMS-2. CF and SEF were reported as age-corrected standard scores, obtained from the Bayley-IV. We used multiple linear regression to examine the association between toddlers' baseline characteristics (MC, CF, SEF and age) and their ΔMC ($MC_{T1} - MC_{T0}$).

Results: The model was statistically significant ($F = 16.813$, $p < .001$, Adj. $R^2 = .415$). Baseline MC was a strong negative predictor of ΔMC ($\beta = -.702$, $p < .001$), suggesting that toddlers with lower initial MC display a more pronounced change relative to the age-expected levels of the PDMS-2, while those with higher baseline MC levels show less progression in terms of those norms. Baseline CF and SEF ($\beta = .199$, $p = .033$; $\beta = .169$, $p = .045$) positively predicted ΔMC, indicating that higher baseline CF and SEF in toddlers are associated with more closely aligning or even exceeding the PDMS-2 expected MC development over six months.

Conclusion: This study indicates that a holistic developmental approach remains key. While baseline MC, CF and SEF significantly predicted the change in MC of our toddler sample, only a small portion of variance was explained. Hence, external factors should also be explored in future research.

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Key policy characteristics in youth athletic pathways: A comparative case study across sports

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Introduction: The International Olympic Committee emphasises the importance of adopting 'best practices' during each developmental phase of youth athletic pathways, tailored to support athletes' progressions and specific needs. However, the unique characteristics of different sports require distinct components and processes, leading to variations in the applied best practices. These differences complicate cross-sport evaluations of policy effectiveness and their impact on sporting success. Therefore, this study aims to address this gap by identifying similar policies within youth athletic pathways (including youth sports, talent identification, and talent development) that influence sporting success across multiple Olympic sports.

Methods: A comparative case study approach was employed, incorporating document analysis and in-depth interviews with elite sports performance directors from 12 Olympic Summer sports in Flanders. An inductive-deductive thematic analysis identified essential youth athletic pathway policies, structured according to systems theory and the Foundation, Talent, Elite, and Mastery (FTEM) development framework.

Results: Preliminary findings underscore the need for a holistic perspective, where inputs, throughputs, and environmental factors collectively influence sporting success. While youth athletic pathway policies vary significantly across sports, they exhibit commonalities, including similar objectives, the involvement of multiple stakeholders, and the integration of ethical and health considerations. These shared characteristics are considered key policy factors in youth athletic development, talent identification, and talent development.

Conclusion: Although youth athletic pathways will inherently remain sport-specific, the identified similarities provide the basis for a comprehensive model that can be applied across disciplines. However, flexible and adaptable policies are necessary to avoid rigid frameworks. Additionally, cultural differences may limit the international applicability of the model. Nevertheless, the findings enhance opportunities for future international comparative research and can serve as a valuable guide for policymakers aiming to design effective sport-specific youth development strategies.

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PhD students – Poster presentations
Gaston Beunen Award

All young researchers who have not yet defended their PhD thesis can participate in this poster presentation competition. The candidates are given three minutes to present their work, after which the jury can ask questions for three minutes. The 1st place winner of this competition will receive a cash prize of 150 euros, while the 2nd and 3rd ranked PhD students will be proclaimed.

This year the following PhD students are presenting their work:

* in order of appearance *

Click on each of the links above to go directly to the corresponding abstract.

Assessment of common electrode placement for electromyography recordings of the triceps surae muscles

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Introduction: Accurate electrode placement is critical in surface electromyography (sEMG) recordings to ensure minimal crosstalk. A widely used guideline for electrode placement is the SENIAM recommendation. However, these guidelines do not account for substantial variation in individual muscle morphology, meaning the suggested sEMG electrode placement may not be optimal for all individuals. This study assessed sEMG electrode placement on the triceps surae muscles by comparing SENIAM-guided placement to expert placement.

Methods: Twenty-four participants (13 females; age: 35.6 ± 11.1 years) underwent electrode placement on the medial gastrocnemius (MG), lateral gastrocnemius (LG), and soleus muscles according to two methods. One researcher followed the SENIAM guidelines, while a second researcher, blinded for electrode placement, used palpation at rest and during contraction. Maximal voluntary contraction (MVC) was measured at 20 degrees plantar flexion and at dorsiflexion using a dynamometer. Ultrasound was used to locate the MG and LG muscle boundaries at a 90 degrees ankle angle and tracked the muscle-tendon junction displacement (distal muscle boundary) during isometric contractions at 40% and 80% MVC. Electrode-muscle boundary distances were calculated, with values of zero indicating the electrode exceeds the muscle boundary, reflecting suboptimal placement.

Results: Our results suggest that SENIAM-guided electrodes on the LG tend to be placed more laterally (distance: 0.73 ± 0.92cm) and distally (5.28 ± 2.59cm) compared to expert placement (4.05 ± 0.86; 10.70 ± 1.46cm respectively). In four participants, SENIAM placements were positioned outside the muscle boundary. For MG, no notable difference between methods was found. In soleus, SENIAM-guided placements were positioned remarkably close to the tibial border (0.65 ± 0.34cm), compared to expert placement (6.25 ± 0.98cm).

Conclusion: We conclude that SENIAM electrode placement for the LG and soleus muscles is suboptimal in some individuals. This increases the risk of crosstalk, affecting the interpretation of the EMG signal.

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Safe Football Allies - Setting up comprehensive safeguarding structures in Belgian elite youth football: Action research

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Introduction: In recent years, athletes across various sports have begun to share their experiences of harassment and abuse. However, football, often characterized by its masculine culture**,** has seen less discourse on these issues. Research indicates that harassment and abuse are prevalent in all sports, including football. As such, there exists a critical need for effective prevention strategies tailored to the unique context of football. In response, this study aims to adapt, evaluate, and implement an existing evidence-based program, Safe Sport Allies, to the elite youth football context and its specific needs, addressing various forms of harassment and abuse (sexual, physical, psychological, and neglect) among elite youth football players aged 14-17.

Methods: This presentation focuses on the first phase of a three-phase action research model: the integration phase, in which the researcher engages with two Pro League youth academies throughout the 2024-2025 season. The researcher identifies existing safeguarding practices and familiarize himself with the club's culture, practices and gaps by engaging in conversations with safeguarding officers, players, their coaches, and their entourage (i.e. staff) and by observing interactions during trainings and games.

Results: Several major themes emerged from the integration phase. First, significant challenges regarding formal safeguarding structures arose. These included issues with the role of Safeguarding Officers (API), such as a lack of role clarity, insufficient visibility within the club, and limited time availability. The absence of a formal complaint mechanism within the club was also noted. Second, observations of coach-player interactions highlighted potential risk situations, particularly during post-game debriefs and how coaches expressed dissatisfaction. Furthermore, coach behaviours—including body language, coaching style, and their role modelling for players and staff—could influence the club's safe environment.

Conclusion: Our findings underscore the interplay between organizational structures and interpersonal dynamics in understanding the safeguarding needs within youth football academies.

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Identifying the clustering of health-related behaviours, obstructive sleep apnea and BMI in the Asklepios study: Network analysis and latent profile analysis

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Introduction: This study examined the covariation of health behaviours (i.e., physical activity, diet, alcohol consumption and smoking), obstructive sleep apnea (OSA) and BMI. Additionally, it identified profiles and examined their association with socio-demographics.

Methods: Cross-sectional data from 1809 participants of the Belgian Asklepios study (2011 – 2016) were used to conduct network and latent profile analyses, containing both variable- and person-centred methodologies. OSA and BMI were measured objectively, whereas the health behaviours were assessed through self-reporting.

Results: The correlations were predominately weak ($r < 0.40$), with only two exhibiting moderate strength ($0.40 \leq r < 0.60$). Positive correlations were observed between AHI and BMI (0.42), alcohol consumption and AHI (0.14), smoking and AHI (0.10), intake of refined grain foods and ultraprocessed foods (0.16), fruit and vegetable intake and whole grain foods (0.24), fruit and vegetable intake and physical activity (0.13), alcohol consumption and physical activity (0.13). Besides, negative correlations were observed between whole grain and refined grain foods (-0.52), physical activity and BMI (-0.12). Four behavioural profiles were identified: Profile 1 (4.5%) was characterized by high levels of OSA, smoking, alcohol consumption, and BMI; Individuals in profile 2 (5.9%) displayed notably higher alcohol consumption, smoking and BMI.; Those in profile 3 (30.2%) exhibited a less healthy dietary pattern; Profile 4 (59.4%) was marked by overall relatively healthy lifestyle habits, along with lower OSA levels and a lower BMI. Males, those living alone and those who are currently unemployed were more prevalent in the unhealthy profiles.

Conclusion: The profiles identified in this study highlight the importance of public health interventions that address multiple behaviours simultaneously among vulnerable groups and at-risk adults.

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TravelTrack: A citizen science tool to explore enablers and barriers to inform interventions that promote more equitable and healthier environments

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Introduction: Citizen science is a valuable approach for engaging the public in research and generating data to inform health and environmental policies. At Ghent University, we developed TravelTrack, a citizen science tool to assess active travel environments. For the ERA4Health project "YAHEE" (Young Adults in Health-enhancing Equitable Environments), we expanded TravelTrack to also assess food environments. YAHEE aims to identify enablers and barriers to interventions that transform food and physical activity environments around schools and universities among young adults from low socio-economic neighbourhoods in Belgium, the Netherlands, France, and Taiwan. Additionally, we aim to further develop TravelTrack by assessing its user experience and utility, and exploring its potential to inform structural and policy interventions that promote more equitable and healthier environments.

Methods: A sample of 1000 young adults (aged 18-25) from low socio-economic neighbourhoods in vocational schools and universities across the four countries (n=250 per country) will be recruited between October and December 2024. Participants will use TravelTrack to map their travel routes, active travel behaviours, food environments, and purchasing habits along these routes. In early 2025, focus groups with 80 participants (20 per country) will assess TravelTrack's user-friendliness, its influence on active travel and food literacy, and the value of its reports for identifying intervention opportunities and supporting policy development. Qualitative data will be analysed using thematic analysis, with an inductive approach to identify emerging patterns, ensuring reliability through data triangulation.

Results: This presentation highlights TravelTrack's functionality in assessing both active travel and food environments. We will review its key features, such as mapping travel routes and identifying food access points, offering valuable insights into participants' everyday environments.

Conclusion: TravelTrack has potential as an advocacy tool, offering insights to guide policy interventions that improve food access and active transport around educational institutions, supporting healthier and more equitable environments.

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Master students – Poster presentations
Gaston Beunen Award

All Master students in Movement and Sports Sciences can participate in the poster session, with 10 of the submissions received being selected for the poster presentation competition. These candidates are given three minutes to present their work, after which the jury can ask questions for three minutes. The 1st place winner of this competition will receive a cash prize of 150 euros, while the 2nd and 3rd ranked students will be proclaimed.

This year the following PhD students are presenting their work:

* in order of appearance *

M1 - De Geest Maud (KU Leuven)

M2 - Ferson Tijs (KU Leuven)

M3 - Hillewaere Ruben (KU Leuven)

M4 - Leemans Mats (VUB)

M5 - Robijns Eben & De Brabander Dries (KU Leuven)

M6 - Terlaeken Nele (KU Leuven)

M7 - Van Herpe Glenn (UGent)

M8 - Vanhove Maxine & Van Renterghem Lien (VUB)

M9 - Veranneman Noor (KU Leuven)

M10 - Vermaercke Nathan & Vermeiren Siemon (KU Leuven)

M11 - Biets Freya & Gouwy Kaat (KU Leuven)

M12 - Brabant Arthur (KU Leuven)

M13 - Erdogan Emre (VUB)

M14 - Müller-Jabush Yoram & Olieslagers Anton (KU Leuven)

M15 - Nica Jasper & De Vos Lars (VUB)

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Myelin changes throughout the life span, related to upper limb motor control

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Introduction: As individuals age, motor control often declines, impairing their ability to perform daily tasks. This decline may be influenced by myelin reduction, which disrupts neural communication and slows motor speed. Myelin, the insulating layer around nerves, is essential for efficient signal transmission within and between brain regions. While age-related myelin reduction is well-established as a contributing factor to cognitive decline, this study will focus exclusively on its impact on upper limb motor control. This study aims to investigate the extent to which age-related myelin reduction contributes to the decline in motor control.

Methods: This retrospective study includes 104 participants (47 females) aged between 18 and 75 years. All participants underwent MRI scans including T1-weighted (MPRAGE) and myelin-sensitive imaging (GRASE) techniques to extract myelin water fraction (MWF) values. Upper limb motor function was assessed through five motor tasks: finger-tapping test, bimanual tracking task, multi-limb reaction time task, purdue pegboard test and a rotation task. To assess the effects of age on myelin content, MWF values were extracted from 3 subregions of the corpus callosum using Matlab and FSL software and correlated with age. Further mediation analyses will explore relationships between age, myelin levels and motor performance.

Results: Preliminary results from a fifth of the MRI data show the highest MWF in the splenium, followed by the body and genu, with its relation to upper limb motor control yet to be determined.

Conclusion: Due to the preliminary state of the data analysis, no conclusions are yet available. However, it is expected that aging will negatively impact upper limb motor control. It is also anticipated that aging will negatively affect myelin. We expect that this data will determine the extent to which age-related myelin reduction contributes to the decline in upper limb motor control.

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Ketonediol ingestion does not impact exercise performance following either a 7hr normoxic or hypoxic post-exercise recovery period

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Introduction: Ketone supplements were initially considered a potent strategy to acutely improve endurance performance. Despite inconsistencies due to variations in ketone supplements, dosing, and nutritional strategies, the current consensus is that acute ingestion of ketone supplements during exercise rather impairs exercise performance. Nevertheless, increasing evidence indicates ketone supplementation may improve post-exercise recovery and mitigate reductions in blood oxygen saturation during hypoxic exercise. We evaluated whether ketone supplementation can improve performance during a 15-minute time trial (TT) performed in normoxia or hypoxia, 7h following a 1h high-intensity training session.

Methods: Fifteen well-trained individuals completed a randomized, placebo-controlled, crossover trial. Each trial included 1h high-intensity interval training followed by 7h recovery in normoxia (N) or at a simulated altitude of 3,000m (H). During recovery, subjects received hourly either (R)-1,3-butanediol (KiQ) or non-caloric placebo (PL) drinks. After recovery, a 15-minute all-out TT was conducted under normoxic or hypoxic conditions.

Results: Blood ketone concentrations increased in the KiQ-condition but not in PL (3–4mM in KiQ vs. <0.5mM in PL, $p<0.001$). Independent of nutrition, hypoxia impaired TT performance by 14% ($p<0.001$). In both N and H, KiQ decreased pH ($p<0.001$) and bicarbonate ($p<0.001$) without altering average heart rate during TT ($p=0.72$).

Conclusion: Our results indicate that, in contrast to previous studies reporting impaired endurance performance after acute ketone monoester supplementation, no such impairment was observed. The absence of impairment, despite acidosis and lower buffering capacity, might be due to improved post-exercise recovery, reducing fatigue during TT. Alternatively, prolonged ketone intake (~7h vs. <3h) may increase the contribution of ketones as energy substrates, compensating for acidosis. The use of a ketone precursor in this study, unlike the ketone ester used in earlier studies, may influence ketone kinetics and physiological effects. Further research is needed to explore interactions among recovery dynamics, ketone formulations, and metabolic reactions in performance.

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The ankle strategy may be an energy-efficient strategy to stabilize walking against sagittal plane perturbations

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Introduction: Humans may use a combination of balance strategies to stabilize walking, i.e. by stepping or regulating ankle torques. The contribution of the ankle strategy to balance control is not yet fully understood. The aim of this study was to identify the contribution of different balance control strategies to the metabolic cost of stabilizing walking. We hypothesized that, people who rely on the ankle, compared to the stepping, strategy consume less energy to stabilize walking in the presence of perturbations.

Methods: Twenty-two healthy adults walked on a treadmill with and without quasi-random belt-speed perturbations at walking speeds of 0.8, 1.2, and 1.6 m/s. We measured metabolic energy consumption using indirect calorimetry. So far, we analyzed data of seven subjects. We calculated stepping parameters (mean and standard deviation step width and length), representing stepping strategies, and ankle gains (K_p and K_v) from delayed COM kinematic feedback, representing ankle strategy. Finally, we explained changes between perturbed and unperturbed walking in energy rate by changes in stepping parameters and ankle feedback gains using regression.

Results: Subjects who increased their average step length, i.e. increased stepping frequency, also increased metabolic cost in response to perturbations. Increasing stepping frequency could be an anticipatory strategy to increase the number of stepping corrections. Subjects who decreased ankle position gain (K_p) in response to perturbations also increased the metabolic cost of walking which could indicate that people who relied more on ankle strategy to stabilize walking decreased energy cost.

Conclusion: These preliminary results suggest that, subjects we who stabilized walking by increasing the number of stepping corrections also increased the metabolic cost of walking. in contrast, subjects who relied more on ankle responses to stabilize walking decreased energy consumption to stabilize walking. Therefore, these results may suggest that the ankle strategy may be an energy-efficient balance control strategy.

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Examining profile clustering based on children's actual and self-perceived motor competence when performing motor skills on land versus in water

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Introduction: Profile clustering of children's actual motor competence (AMC) and perceived motor competence (PMC) has mainly been examined for movement tasks performed on land. Examining this in an aquatic context, however, could be useful in identifying children at risk for drowning. Therefore, this cross-sectional study aimed to identify profiles in typically developing first grade primary school children based on their AMC and PMC regarding their performances both on land and in water.

Methods: A total of 98 children were recruited, of whom 93 children (i.e., 43 boys (6.82±0.46 years) and 50 girls (6.84±0.39 years)) were eligible for further analyses. In addition to basic anthropometric measurements, data collection methods included the 3rd version of the Test of Gross Motor Development (TGMD-3), the Perceived Movement Skill Competence for young children (PMSC), the Actual Aquatic Skills Test (AAST) and the Pictorial Scale for Perceived Water Competence (PSPWC). K-means cluster analyses were conducted to identify different land-based versus water-based MC profiles from the collected data. Chi² tests were used to investigate differences in terms of sex and weight status between profiles within the identified cluster solution per movement environment.

Results: On land, AMC-PMC profile clustering resulted in three unaligned 'High-Average', 'Average-High', and 'Average-Low' scoring profiles. In water, one aligned 'Low-Low' scoring profile was identified alongside two unaligned 'High-Average' and 'Average-High' scoring profiles. No significant sex nor weight status differences were identified between and within both land- and water-based profiles.

Conclusion: Tailored motor skill interventions should be designed in school-assisted or family-assisted settings to successfully align AMC and PMC in overestimating and underestimating profiles. In addition, there is a need to educate young children through attitudinal and behavioral interventions in order to move safely and effectively both in water and on land in view of enhancing physical activity and reducing injury and/or drowning risk.

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Cannabidiol: A dose-response study at lower doses

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Introduction: Cannabidiol (CBD) is a non-psychoactive phytocannabinoid with promising applications in sports performance, including anti-inflammatory, analgesic and sleep-promoting effects. Despite its growing popularity in both clinical and general populations, research into its pharmacokinetics and pharmacodynamics at lower doses, which are often used by athletes, remains limited. The lack of evidence-based dosing guidelines poses challenges for its safe and effective use. To address this gap, this study investigates the bioavailability of CBD at four doses, providing insights into its dose-response relationship that is relevant for athletes.

Methods: Nine healthy male volunteers (18–40 years) participated in this double-blind, placebo-controlled, crossover study. Participants received 50, 100, 150, and 200 mg in a randomized order, separated by a one-week washout period. Blood samples were collected at baseline and at 1, 2, 3, 4, 5, 6, 12, 24, 48, 72, and 120 hours post-administration. Pharmacokinetic parameters (Cmax, Tmax, AUC) were determined using high-performance liquid chromatography. Adverse events were monitored via questionnaires.

Results: In general, doses were well-tolerated, with limited side effects. Though pharmacokinetic analysis is still ongoing, we anticipate a dose-dependent increase in systemic CBD concentration. Based on existing literature on CBD pharmacokinetics, a direct proportional relationship is expected, with no plateauing. We anticipate Cmax and AUC to demonstrate a linear and dose-proportional increase across the four doses, respectively.

Conclusion: This study provides crucial insights into the bioavailability of CBD at commonly used, subtherapeutic doses, addressing critical gaps in the literature. Understanding the bioavailability of CBD at these doses will help to optimize supplementation strategies by revealing appropriate timing and frequency of intake. These findings will support safe and effective CBD use in athletes while providing a foundation for future research into the performance-enhancing effects of CBD.

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Training bimanual coordination in aging: A pilot study

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(*) Shared first authorship

Introduction: Bimanual coordination is essential for daily tasks like tying shoelaces or typing. Therefore, age-related declines in these skills can reduce older adults' (OA) functional independence. Compared to younger adults (YA), OA exhibit decreased accuracy, increased variability, and slower movement times. These deficits demand interventions to maintain bimanual coordination or mitigate age-related impairments. Additionally, as OA represent a growing workforce segment, improving these skills has socio-economic importance. While complex task training improves bimanual skills in YA, its effectiveness in OA remains unclear. This pilot study investigates the time required for YA and OA to reach the autonomous phase or performance plateau in an asymmetric bimanual coordination task and examines attentional demands using a dual-task paradigm. Future research will explore associated neurological changes in OA.

Methods: Participants (n_{YA} = 5, 18–35 years; n_{OA} = 10, ≥65 years) will practice a 1:2 wrist coordination task with and without augmented visual feedback (provided as Lissajous plots) over two weeks (4 sessions/week). Movements will be recorded via LightBuzz markerless motion capture software. Performance will be evaluated pre-training (PRE), midway (MID), and post-training (POST), with a retention test one week later. The autonomous phase will be assessed by absence of dual-task interference, using a Word Memory task. Kinematic analysis will focus on Relative Phase (RF) and Phase Velocity Ratio (PVR) as coordination quality markers.

Results: We hypothesize that YA will reach the autonomous phase faster than OA, as reflected in stable RF and PVR accuracy and reduced variability.

Conclusion: This pilot study lays the groundwork for understanding motor learning in aging populations and optimizing bimanual coordination interventions.

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Park visitation and physical activity in Ecuadorian adolescents: Exploring prevalences and differences according to park characteristics

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Introduction: Physical activity (PA) has many beneficial effects on mental and physical health. Yet, despite this knowledge 81% of the adolescents does not meet the PA guidelines set by the World Health Organization. Furthermore, cities are becoming increasingly dense and should be optimally designed to stimulate PA. Urban parks can be an important setting to improve PA, as they are accessible to everyone. There has been a lot of research on what attracts adolescents to visit parks and how often they engage in PA in the parks, but these studies are mainly conducted in Europe, the USA and Australia. Currently, there is a lack of research in Latin America. We want to provide an overview of park visitation, describe park characteristics of urban parks and examine how these park characteristics are related to park visitation and physical activity in Ecuadorian adolescents.

Methods: We made a proportional sample of 20 parks in Cuenca, Ecuador consisting of eight peri-urban, two urban linear and ten urban non-linear parks. The number of park users and their PA levels were observed for seven consecutive days using the System for Observing Play and Recreation in Communities tool. Park features of the 10 most visited parks were observed using the Environmental Assessment of Public Recreation Spaces observation tool. These observations were conducted by four observers, in teams of two. Descriptive analyses and linear regression models will be conducted.

Results: Preliminary results show that male visitors are more active than female visitors and that 46% of the park visitors engage in sedentary behaviour. Thirteen percent of the park visitors were adolescents. We hypothesize that park use and park-based PA will be higher in parks with playgrounds, sport fields and goals, climbing structures, trails and paths.

Conclusion: As this study is still ongoing, no conclusions can be drawn yet.

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Exercise intensity during a boxing game performed in virtual reality versus in a traditional game setting among adults with and without stimulated age-related macular degeneration

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Introduction: This study aims to compare intensity levels and pleasure experience between a virtual reality (VR) boxing game and a traditional game setting (TGS) boxing game in adults both with and without age-related macular degeneration (AMD) simulation glasses.

Methods: A total of 24 participants (mean age 58.2 ± 7.4 years, 58.2% women), aged 50 years and older, were recruited through convenience sampling. Each participant completed four five-minute boxing trials in a randomized order, combining two settings (VR and TGS) with two vision conditions (with and without wearing AMD simulation glasses). In each trial, intensity was measured objectively using a chest-worn Polar heart rate (HR) monitor and subjectively with the Borg Rating of Perceived Exertion scale (RPE). Pleasure was assessed using a Visual Analog Scale (VAS). Objective and subjective intensity levels, along with pleasure experience, were analyzed using three two-way repeated measures ANOVAs to evaluate the effects of setting and vision.

Results: No interaction effects were observed across the three analyses (HR: p=0.298; RPE: p=0.556; VAS: p=0.234). Additionally, no significant main effect of setting was found on either objective intensity (p=0.052) or subjective intensity (p=0.474). Similarly, vision did not have a significant main effect on objective intensity (p=0.081) or subjective intensity (p=0.457). However, significant main effects were identified on experienced pleasure for setting, with participants reporting higher pleasure in VR compared to TGS (p<0.001), and for vision, with participants reporting higher pleasure without the AMD simulation glasses (p=0.004).

Conclusion: VR and TGS showed similar intensity levels regardless of whether AMD simulation glasses were worn. However, VR was perceived as more pleasurable, which could enhance the exercise experience for individuals with late-stage AMD. This underscores VR's potential as a valuable tool in physical activity.

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Exogenous ketosis stimulates serum erythropoietin and microvascular function during normoxic and hypoxic post-exercise recovery

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Introduction: Vascular adaptations such as the formation of novel capillaries in skeletal muscle tissue, are a primary response to endurance exercise and hypoxia. This increases oxygen and nutrient delivery to the muscle, improving performance and recovery. Recent studies indicated that ketone body supplementation improves vascular function and promotes muscular angiogenesis, the latter by increasing circulating erythropoietin (EPO). However, the acute effect of post-exercise exogenous ketosis and hypoxia on EPO and vascular function remains unclear. We aim to identify how exogenous ketosis impacts EPO and vascular function during normoxic and hypoxic post-exercise recovery.

Methods: Fifteen young, healthy volunteers participated in this double-blind, placebo-controlled crossover study containing four experimental sessions. Each session included a 1-hour cycling interval training, followed by 7 hours of passive recovery at sea level (N) or simulated altitude of 3000m (H). Participants received either hourly ketone- (KIQ) or placebo- (PL) drinks. Serum EPO and endothelin-1 (ET-1) were determined at 0h, 3h, 5h and 7h post-exercise. Vascular function was evaluated at 0.5h, 3.5h and 6.5h post-exercise using near-infrared spectroscopy at the m. vastus lateralis during a 5-minute vascular occlusion protocol.

Results: Serum beta-hydroxybutyrate increased to ~2.2mM in KIQ but remained low (<0.5mM) in PL ($p<0.001$). Relative to PL, KIQ increased serum [EPO] (+~8.6%) in N and H ($p=0.037$), but decreased serum [ET-1] (-~8.2%) in N and H ($p=0.006$). Post-occlusion oxygen reperfusion rate increased more from 0.5h to 6.5h in KIQ (+~13%) compared to PL (+~4%) ($p=0.02$).

Conclusion: Our results indicate that KIQ effectively elicits exogenous ketosis, thereby increasing serum [EPO] in N and further elevating its H-induced increase. Furthermore, KIQ improves vascular function both in N and H, as evidenced by an increased oxygen reperfusion rate. Moreover, the KIQ-induced reduction in serum [ET-1] reveals an increased post-exercise vasodilation. Conclusively, KIQ stimulates circulating erythropoietin and enhances vascular function.

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Ketone ester ingestion did not counteract the decline in exercise performance during a simulation of the Absa Cape Epic cycling race

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Introduction: The excessive physical strain of multi-day ultra-endurance events increases the risk of developing non-functional overreaching which results in maladaptive physiological responses that will eventually impair exercise performance. Earlier research indicated that post-exercise ketone ester (KE) supplementation may attenuate the development of overreaching symptoms during an overtraining period, resulting in an increased endurance performance. Therefore, we hypothesized that KE supplementation may also attenuate performance decrements during a simulated multi-day cycling race.

Methods: Twenty recreationally active cyclists participated in an 8-day laboratory simulation of the Absa Cape Epic (RACE). Measurements were performed on the day before (PRE) and after (POST) RACE. Measurements included mean power output and maximal heart rate during an all-out 30-min cycling time-trial ($TT_{30'}$) and a questionnaire on muscle soreness. Immediately after exercise and 30-min before sleep, participants received either 25g of (R)-3-hydroxybutyl-(R)-3-hydroxybutyrate (KE; n = 8) or an isocaloric placebo (CON; n = 10). Data were analysed via two-way ANOVA.

Results: Both groups showed a 3% decrease in mean power output (PRE: 270.5 ± 3.6W *vs.* POST: 262.3 ± 3.6W, $p < 0.05$) during $TT_{30'}$. Likewise, maximal heart rate dropped in both groups by ~10bpm (PRE: 174 ± 1.9bpm *vs.* POST: 163 ± 0.3bpm, $p < 0.0001$) from PRE to POST. Throughout RACE, perceived muscle soreness (day 5-8 vs. day 1, $p < 0.05$) increased equally in both experimental conditions.

Conclusion: The 8-day simulation decreased $TT_{30'}$ performance and maximal heart rate in both groups, indicating that KE was ineffective to preserve exercise performance. KE did not influence perceived muscle soreness across the study period. Taken together with available literature, our results suggest that the beneficial effects of KE on overreaching symptoms only develop during longer (e.g., 3 weeks) periods of excessive exercise.

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The impact of contextual cues on motor adaptation to opposing force fields

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Introduction: Motor learning is essential for optimizing skill acquisition and rehabilitation. Interference occurs when opposing force fields clockwise (CW) and counterclockwise (CCW) are presented sequentially, but this can be reduced by associating each field with a unique contextual cue. This study examines motor adaptation, the process of adjusting movements to unexpected forces, using contextual cues to reduce interference. Following Howard et al. (2013), who used premovement direction as a cue, we aim to replicate and extend this work in healthy young adults to explore potential applications for older populations.

Methods: Forty right-handed participants will perform reaching movements using a Kinarm robotic system. Divided into two experimental and two control groups, participants will encounter velocity-dependent force fields (CW/CCW). Experimental groups will use distinct starting positions (± 135° from the target) as contextual cues, with one position associated with CW and the other with CCW force fields. Control groups will use less distinct starting positions (± 175°). The protocol includes pre-exposure, exposure, and post-exposure phases. Successful adaptation is indicated by reduced movement error over trials.

Results: Data collection is ongoing. Based on prior research, we anticipate improved adaptation in the experimental group, with reduced interference between opposing fields due to the use of distinct starting positions. This is in line with findings by Howard et al. (2013), demonstrating that clear contextual cues enhance motor adaptation by reducing interference.

Conclusion: Our results may distinguish from previous findings, due to the use of a new type of control, by varying the distance between the contextual cues. Hence, preliminary findings are anticipated to align with prior research, suggesting that distinct starting positions serve as effective contextual cues, but only when the difference is sufficiently large. This will enhance motor adaptation and reduce interference between opposing force fields, in young adults.

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Brain endurance training: A path towards a systematic review

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Introduction: Brain endurance training (BET) is an innovative training method in sport science designed to counter the detrimental effects of mental fatigue. By combining the physical component with a cognitive load, BET aims to build a cognitive resilience. Existing literature has already proven the many benefits of this training method in various sports, such as soccer, cycling, padel, running and resistance sports. Despite the promising results, there is a limited understanding of its mechanisms and optimal protocols. This first systematic review aims to evaluate existing literature on BET, focusing on its timing, duration, psychological -and physiological effects.

Methods: A systematic search will be conducted in PubMed, Scopus, Web of Science, and similar databases using databases using terms such as "cognitive training" and "physical performance" Titles, abstracts, and full texts will be screened independently by two reviewers. Inclusion criteria will targeted studies involving cognitive interventions to reduce mental fatigue, while exclusion criteria filtered studies unrelated to BET or lacking physical outcomes. Data extraction is focused on study design, population, interventions, and outcomes. The quality of included studies will be done using AMSTAR2, and data synthesis aims to identify trends and gaps in existing research.

Results: As the final result of the systematic review are not yet completed, no results will be presented in for this systematic review.

Conclusion: The aim of this poster is to highlight the need for a systematic review on brain endurance training.

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Associations of lean mass and phase angle lower inter-limb asymmetry magnitude with training volume and running performance

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Introduction: Inter-limb asymmetry has recently gained increasing attention being considered as potentially detrimental to athletic performance. However, research exploring the relationship between morphological asymmetry and running performance is very scarce. This study aimed to investigate (1) the association between training volume, and lean mass (LM) and phase angle (PhA) lower inter-limb asymmetry magnitude; and (2) the association between LM and PhA lower inter-limb asymmetry magnitude, and running performance.

Methods: This cross-sectional study included 59 adults (29 males, 30 females; aged 20–51 years). Training volume (i.e., hours spent running per week) was self-reported via an online questionnaire. Bioelectrical impedance analysis (BIA, Inbody S10) measured segmental LM and PhA. Lower inter-limb asymmetry magnitude was calculated using the percentage difference method: ((highest value – lowest value) / highest value) × 100. Running performance was assessed using the Cooper test (i.e., distance covered within 12 minutes). Adjusting for participants' age and sex, multiple linear regression analyses examined (1) the predictive value of training volume for lower inter-limb LM and PhA asymmetry magnitude; and (2) the predictive value of lower inter-limb LM and PhA asymmetry magnitude for running performance.

Results: Our results demonstrated no significant associations of training volume with the magnitude of lower inter-limb asymmetry in LM ($p = 0.055$, $\beta = -0.251$) and PhA ($p = 0.204$, $\beta = -0.169$). Additionally, no significant associations were observed of the magnitude of lower inter-limb asymmetry in LM ($p = 0.625$, $\beta = -0.060$) and PhA ($p = 0.516$, $\beta = -0.079$) with running performance.

Conclusion: These findings suggest that distance runners' training volume is not associated with the magnitude of LM and PhA asymmetry at the lower limb level, and that the latter does not relate to running performance. Further research on the impact of inter-limb asymmetry in terms of injury risk also seems warranted.

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DFAa1 as a marker of fatigue: Comparing responses to light, moderate, and high-intensity training with matched workloads

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Introduction: Recovery after exercise is essential for optimization of training and performance, requiring a balance between stress and recovery. DFAa1, a non-linear heart rate (HR) variability index, has gained attention for its potential to monitor fatigue showing suppressed values during prolonged exercise. However, responsiveness of DFAa1 to training sessions of different intensities with identical workload remains unexplored.

Methods: Eighteen participants (18-35yrs, BMI<25, ≥5h endurance training/week) performed three training sessions (light, moderate, high-intensity) separated by at least one week. Training sessions were matched for workload by adapting time (joules), calculated using the formula $E=P\times\Delta t$. Light and moderate training was performed at LT1 and LT2 power, respectively, based on maximal incremental exercise test results. High-intensity training followed a 10x1-minute HIIT protocol at 110% VO_2max alternated with 1 minute rest at 80% LT1 power. Mean DFAa1 and HR were calculated during the final two minutes of a standardized 10-min warming-up (WU) and cooling-down (CD) at LT1 power to assess intensity-specific physiological changes.

Results: Mean differences in DFAa1 and HR (beats/min) values between the last two minutes of WU vs. CD were 0.051 (±0.160), p=0.66 and 6.50 (±3.67) beats/min, p=0.27 for light-intensity, 0.285 (±0.140), p=0.006 and 8.28 (±3.48) beats/min, p=0.14 for moderate-intensity, and 0.321 (±0.222), p=0.009 and 9.39 (±5.71) beats/min, p=0.11 for HIIT. Repeated measures ANOVA of DFAa1 during WU vs. CD revealed significant differences for light vs. moderate (0.234, p<0.001) and light vs. HIIT (0.269, p<0.001). However, no significant difference was observed for moderate vs. HIIT (0.035, p=0.486). Differences in HR values for WU vs. CD were not significant over training intensities.

Conclusion: The greater responsiveness of DFAa1 to training intensity, compared to HR, highlights its potential as a marker of fatigue. This responsiveness suggests DFAa1 could serve as a practical tool for monitoring physiological stress and personalizing exercise programs to enhance recovery.

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The magnitude of lower inter- and intra-limb functional asymmetry in healthy endurance runners: A systematic review

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Introduction: The magnitude of inter- and intra-limb asymmetry has extensively been studied in unilateral sports. Previous research highlighted the possible influence of asymmetry on sport performance and/or injury risk. However, research on the magnitude of inter- and intra-limb functional asymmetry in endurance runners is very scarce. Therefore, this systematic review aims to provide a thorough overview on the research performed on the magnitude of both inter- and intralimb functional asymmetry at lower-limb level in healthy endurance runners.

Methods: A systematic search was conducted using Pubmed, Web of Science, and SPORTDiscus for studies investigating the magnitude of inter- and intra-limb functional asymmetry in healthy endurance runners. Studies with sprint athletes (running up to 400m distances) or injured runners were excluded. A modified version of the quality assessment tool for observational and cross-sectional studies was used to identify the quality of the included studies.

Results: From the 4897 articles screened, 7 articles were included in the review. The quality score of the articles ranged between 7/10 and 9/10. Inter-limb asymmetry ranged between 0.20% and 14.20% whereas intra-limb asymmetry ranged between 1.61% and 4.04% in the asymmetry metrics evaluated. More specifically, inter-limb asymmetry magnitudes in range of motion varied between 16.30% and 39.60%, whereas inter-limb asymmetry in balance ranged from 3.26% to 31.72%, while an asymmetry in jumping height of 5.50% was observed.

Conclusion: The heterogeneity in study methods and outcomes emphasizes the high individual, task, test and metric nature of inter- and intra-limb asymmetry. The magnitude of inter- and intra-limb functional asymmetry varied between 0.20% and 39.60%. This large range in asymmetry magnitudes between studies highlights the need for more consistent and reliable research on asymmetry. In addition, future researchers should investigate which specific asymmetry scores are most relevant for measuring asymmetry.

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Post-Doc – Poster presentations

All Post-Docs in the field of Movement and Sports Sciences, who already obtained their doctoral degree, can also contribute to the poster session without participating in any competition.

This year the following Post-Docs are presenting their work:

* in order of appearance *

Stegen Sanne (UGent)

Service design for healthy aging: Addressing needs for the 50+ age group

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Introduction: As populations age globally, fostering well-being and healthy lifestyles among middle-aged and older adults becomes a pressing priority. This Erasmus+ project aims to address the healthy aging needs of individuals aged 50+ by combining innovative educational practices, service design principles and business modelling approaches. The project collaborates across partner countries to develop and implement effective strategies for promoting healthy aging through education and service development.

Methods: This collaborative initiative undertook a multi-step approach: 1) Conducting comprehensive research to identify the specific needs and preferences of the target demographic in well-being and healthy lifestyle domains. 2) Evaluating best practices in service design and educational methodologies for healthy aging in the participating partner countries. 3) Developing, testing, and implementing a four-course online study module (20 ECTS) in English, focusing on service design for wellness and healthy aging tailored to the 50+ age group. 4) Designing supportive teaching materials for students and instructional guidelines for educators. 5) Executing a pilot program with students and educators to refine the study module through feedback-driven improvements.

Results: The project successfully developed a well-structured and accessible online study module that integrates service design principles with wellness and healthy aging education. A pilot program with students and educators has been executed to evaluate the module's effectiveness and relevance. However, the results from the pilot program are still being analysed and will provide critical insights for further refinement of the study module.

Conclusion: This project underscores the value of interdisciplinary collaboration in addressing the wellness and lifestyle needs of older adults. The study module and accompanying teaching resources provide scalable tools for educators and service designers, fostering a culture of health-conscious service innovation for aging populations.

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