Abstracts

Tuesday 29th June, 10.00 – 11.30

<https://stmarys.zoom.us/j/89944585609?pwd=dExPczlGeDRMRkpXZXhmaENic1BxUT09>

**Theme 3: Learning and Learning Environments (Session Chair: Kyriaki Myrissa)**

**Talk 1: Alex Woodhead:** Corticospinal and Spinal Adaptations to Lower Limb Motor Skill Training in Healthy Individuals: A Meta-Analysis and Best Evidence Synthesis

**Talk 2:****Claire Mulvenna (Tom Hounsell presenting):** An Examination of the role of performance analysis in youth academy soccer – Understanding player and coach behaviour

**Talk 3: Maeve Murray:** Comparison of Test of Gross Motor Development – Second Edition and Test of Gross Motor Development Third Edition: Can you predict FMS competency?

**Talk 4:** **Anne Majumdar:** Lessons for SAHPS student recruitment on the barriers and facilitators of attaining enrolment as the first in their family to attend HE

Title: Corticospinal and Spinal Adaptations to Lower Limb Motor Skill Training in Healthy Individuals: A Meta-Analysis and Best Evidence Synthesis

Presenter: Alex Woodhead

The acquisition and long-term retention of motor skills is fundamental for youth development, rehabilitation following orthopaedic injuries and neurological conditions, as well as maintaining functional independence in the elderly (Berghuis et al. 2017). Motor skill learning refers to the process in which movements are executed more quickly and accurately with practice (Dayan and Cohen, 2011), with consistent evidence supporting anatomical and physiological adaptations within the primary motor cortex (M1) in animal and human models (Jensen et al. 2005; Nudo et al. 1996; Remple et al. 2001). With the advent of transcranial magnetic stimulation (TMS), it is possible to explore the mechanisms underlying neuroplasticity and how they contribute to motor skill acquisition and retention. In turn, understanding the neural processes that occur can aid in the development and application of optimal training strategies, in the attempt to offset the adverse effects of aging or rehabilitate neurological diseases.

The corticospinal tract (CST) plays a key role in motor control (Lemon, 2008), with the plastic modifications that occur within the corticospinal pathway crucial for the acquisition of skilled movements (Nielsen and Cohen, 2008). The most persistent health consequence following CST lesion is functional foot drop, described as a gait abnormality in which the ankle dorsiflexor muscles are impaired (Burridge et al. 2001). Until the work of Perez et al. (2004), it was unknown whether the plastic changes following motor skill training were isolated to the hand and arm regions of the M1. Despite the need to rehabilitate these associated brain areas following illness or injury, understanding the responses in the leg cortical regions would improve gait ability and, in turn, accelerate the recovery process post-injury. It was demonstrated that following 32 minutes of skill training increased MEP response and reduced short-interval intracortical inhibition (SICI) in the tibialis anterior (TA), concluding that motor performance was improved following motor skill learning in the lower limbs and placing the site of adaptation at cortical levels (Perez et al. 2004).

Single sessions of motor skill training have been shown to facilitate changes in the CST (Dickins et al. 2015).  Similar to the findings of Perez et al. (2004), rapid and transient elevations in MEP amplitudes accompanied with a reduction in SICI have been consistently reported (Coxon et al. 2015; Muellbacher et al. 2001). In addition, there was also an immediate improvement in motor performance, suggesting that the neural adaptations observed may be functionally relevant (Rogasch et al. 2009). Despite a large amount of research focused on the upper body responses to motor skill training, there seems to be a lack of literature assessing the corticospinal responses to single sessions in the lower limb. It has been stated that the corticospinal projections to the TA are more pronounced compared to the other lower limb motoneurones (Brouwer and Ashby, 1990), and this may have functional relevance for individuals with deficits following disease. However, it is unknown whether different muscles within the lower extremities modulate corticospinal plasticity compared to that seen within the TA, or that of the upper limbs.

Given the focus of research targeting upper limb muscles following motor skill training, there is need to expand the knowledge further on how the lower limbs tasks influences the corticospinal response. In turn, it will enable targeted and effective guidelines for the prescription of lower limb exercise to improve functional outcomes following injury and disease.

Title: An Examination of the role of performance analysis in youth academy soccer – Understanding player and coach behaviour

Presenter: Claire Mulvenna (Tom Hounsell presenting)

The increasing use of performance analysis within the coaching process has seen many coaches and players place high importance on the findings derived from the analysis of performance (Liebermann et al., 2000). Similarly, coaches are now being readily encouraged to use technology to support their own professional development (Partington and Cushion, 2013). However, little is known of how performance analysts work in elite youth soccer is used to support coach development as well as player development. As such this research aims to; Identify the ways that performance analysis is used to monitor and evaluate players and examine the extent to which coaching behaviour may also be analysed. Finally, the research aims to appraise the use of performance analysis findings within the coaching process to manage player and coach development.

This research is using semi structured interviews with 12 performance analysts who have a minimum of 12 months paid experience working in the youth development or professional development phase of an EPPP academy one or two. A semi-structured approach will be used in order to allow each analyst to be asked a standard set of questions that will be used as the framework of the interview but that can be adapted in terms of order of questions and to include probing questions based on the responses of the analyst (Jones, 2015). This approach will allow each individual interview to cover the same topics but to be adapted to allow the interview schedule to follow the discussion taking place. The semi structured interviews are due to take place in early 2021 and it is anticipated data will be analysed by the end of March 2021.

Title: Comparison of Test of Gross Motor Development – Second Edition and Test of Gross Motor Development Third Edition: Can you predict FMS competency?

Presenter: Maeve Murray

**Introduction:** Fundamental movement skill (FMS) competence is associated with positive, health-related outcomes and can promote physical activity (PA) in adulthood. This study compared FMS proficiency according to the Test of Gross Motor Development, Second Edition (TGMD-2) and Test of Gross Motor Development, Third Edition (TGMD-3). It further investigated the use of TGMD-2 total and subscale scores in predicting FMS competence on TGMD-3.

**Methods:** 212 children (n =112 boys; 52.8%; 12.5 ± 2.4 years) were recruited. FMS skills were assessed using the TGMD-2 locomotor and object control and TGMD-3 locomotor and ball skills subscales. Inter- and intra-rater agreement was 92.7% and 90.3%, respectively. Mastery, near mastery (mastery/near mastery combined) and subsequent poor mastery levels were measured. To predict FMS performance, regression analysis was undertaken using total and subscale scores.

Results: No child achieved mastery in either TGMD-2 or TGMD-3, while the proportion achieving mastery/near mastery (M/NM) decreased from TGMD-2 to TMGD-3 (skills measured in both assessments), reflecting notable differences in skill component criteria. There was a significant relationship between TGMD-2 and TGMD-3 total scores (r=0.945; p<0.01) and subsequent subscales: locomotor skills (r=0.922; p<0.01) and object control/ball skills (r=0.915; p<0.01). Overall TGMD-3 performance can be predicted from performance in both TGMD-2 subscales, with object control (TGMD-2) performance predicting ball skills proficiency (TGMD-3) and locomotor skill performance in TGMD-2 predicting TGMD-3 locomotor skill proficiency.

Conclusions: Skill component criteria changes suggest a higher degree of difficulty achieving mastery in TGMD-3. The ability to predict TGMD-3 from TGMD-2 has important future implications, increasing inter-study comparability and thereby enabling significant advances in our understanding of FMS in youth. Identifying overall levels, trends and inequalities among children and young people is imperative to inform and deliver effective programmes and initiatives aimed at increasing PA, health-related fitness and physical competence levels.

Title: Lessons for SAHPS student recruitment on the barriers and facilitators of attaining enrolment as the first in their family to attend HE.

Presenter: Anne Majumdar

St Mary’s sits within the Cathedrals Group (CCUC) of universities. The 15 institutions within this group have a widening participation agenda and attract a high proposition of First in Family (FiF) students. Many FiF students may have faced a range of barriers to achieving Higher Education (HE) enrolment. This study aimed to explore the presenting features and barriers and facilitators of FiF students at the CCUC university.

Methods: - A mixed methods survey design was used for the study. A questionnaire with a mixture of categorical and open questions was specifically designed for the study, including information on family circumstances whilst growing up, awareness and perception of HE during childhood and motivators and barriers to enrol in HE. All 15 of the CCUC institutions were invited to disseminate the survey link to their students, and it was shared in 8 universities. Descriptive and inferential statistics were used to analyse the categorical data and responses to open questions underwent thematic analysis. Ethical approval was obtained from St Mary’s Research ethics committee. Results: 260 responses were obtained from the study including 197 from FiF students. Of FiF participants nearly half reported to be from working class backgrounds. 17% had not heard of university before being age 15 and 29.5% were over 19 when they first thought might go there. Thematic analysis of open questions identified that FiF students were motivated by providing a more favourable upbringing to their children compared to their own, for following a particular profession and by love of the subject. Barriers included concern over financial impact, lack of understanding of the HE application process, or of equity of qualifications obtained, fear of failure and concern over impact on their family. Discussion& Conclusion: CCUC universities can improve their recruitment by targeting FiF students, offering additional support to applications and having a presence in schools and colleges to increase the cultural capital of these perspective students around HE study.