From Muscle to Screen: How Focus of Attention Shapes Motor Cortex Excitability and Movement Variability

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INTRODUCTION

- Movement variability is key for movement flexibility, **adaptability** and to generate a rich behavioural repertoire[1]
- **Internal focus of attention** (e.g., “contract the muscle”) restricts solutions constraining movement variability[2]
- **External focus of attention** (e.g., “lift the bar”) enabling various solutions to reach the same goal allowing movement variability[2]
- External focus is more efficient with more distance to the body, such as **visual focus of attention** (e.g., “reach the line”)[3]
- Behavioural changes are hypothesized to be underpinned by **neurophysiological mechanisms** within the primary motor cortex[4]

Figure 1 – Focus Conditions

AIM

- Investigate whether a single exercise bout of seated calf raises on a Smith machine, performed under different attentional focus conditions (Internal- muscle, external- bar, visual- screen), acutely influences force variability (Sample entropy), corticospinal excitability and corticospinal inhibition (Silent period)

MATERIALS & METHODS

- 27 participants
- Linear mixed-effects model for repeated measures with focus condition and time as fixed effects and a participant-by-time interaction as a random effect

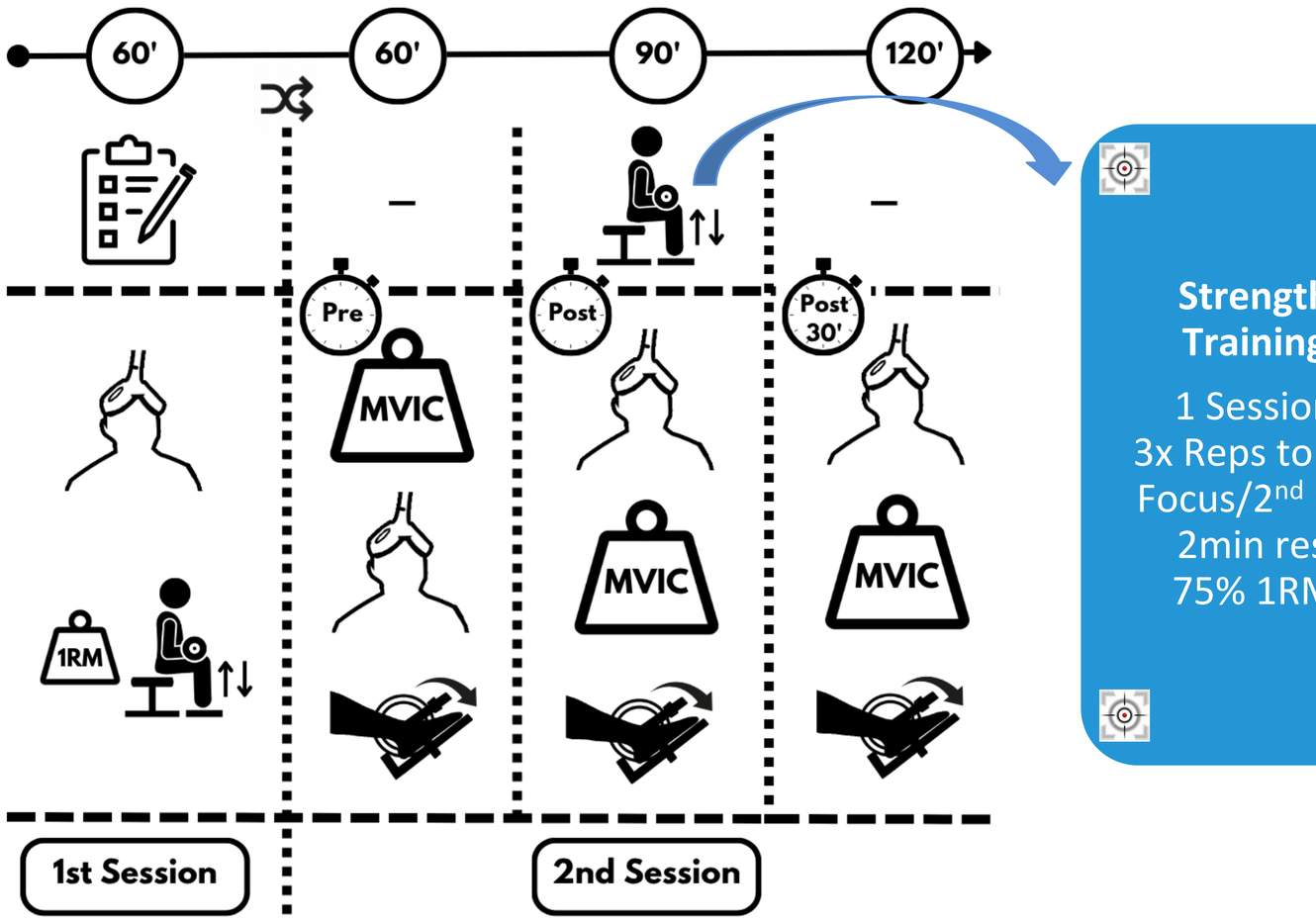

Figure 2 – Experimental design. RM- Repetition Maximum, MVIC- Maximum Voluntary Isometric Contraction

RESULTS & CONCLUSION

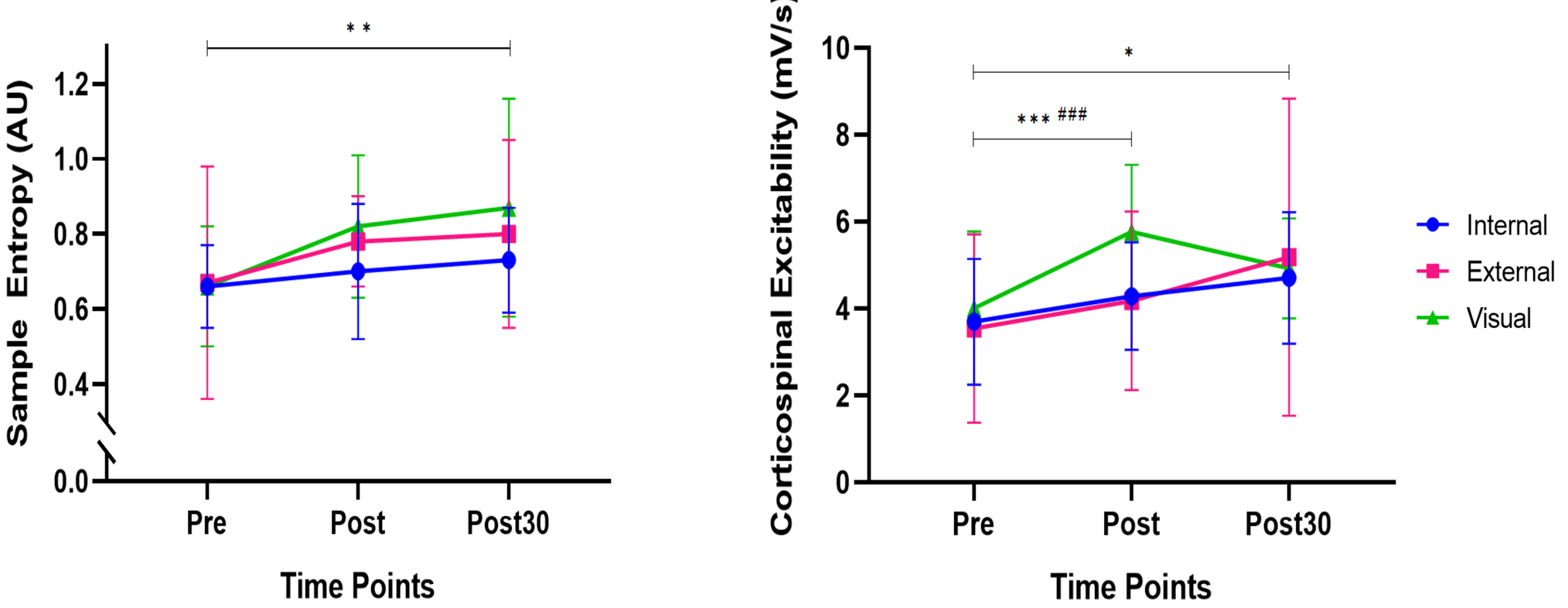

*Figure 3 – Data are presented as mean values with standard deviation. * time effects, # interaction effects. *** p < 0.001, ** p < 0.01, * p < 0.05*

- A single session of exercise can acutely increase **movement variability** (Sample entropy) and **corticospinal excitability**
- Directing attention toward a **distant, visually mediated goal** appears especially effective suggesting benefits for performance and rehabilitation settings

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