

Effects of Internal vs. External Focus of Attention on Cortical Drive Post-ACL Reconstruction: A Preliminary Study

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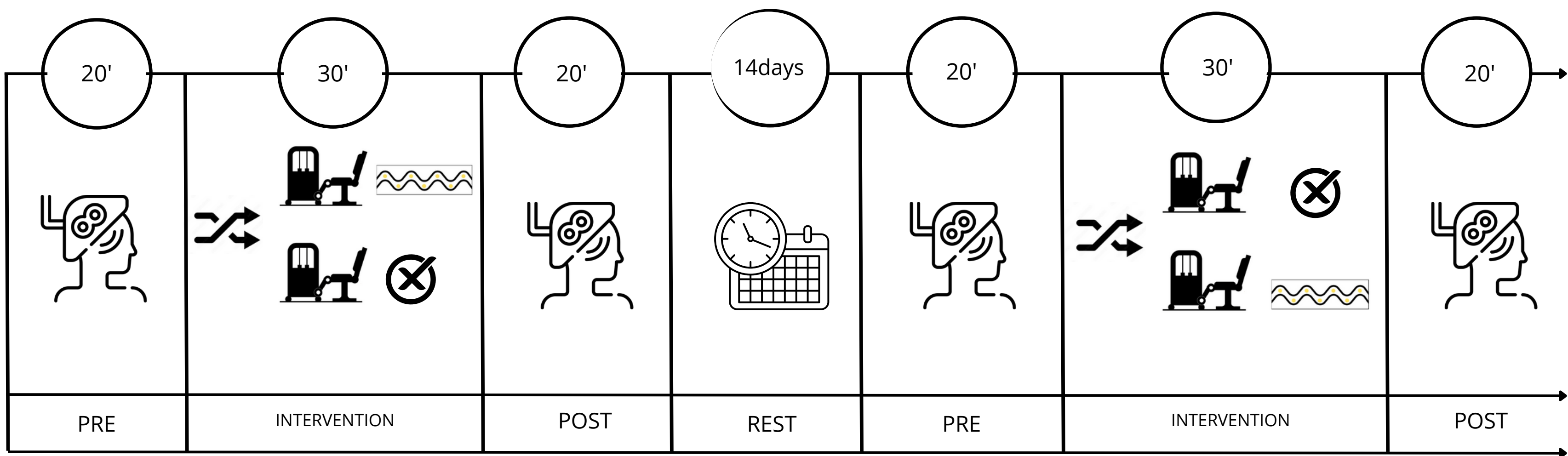
INTEGRATIVE MOVEMENT
IN NETWORKING SYSTEMS
LABORATORY

INTRODUCTION

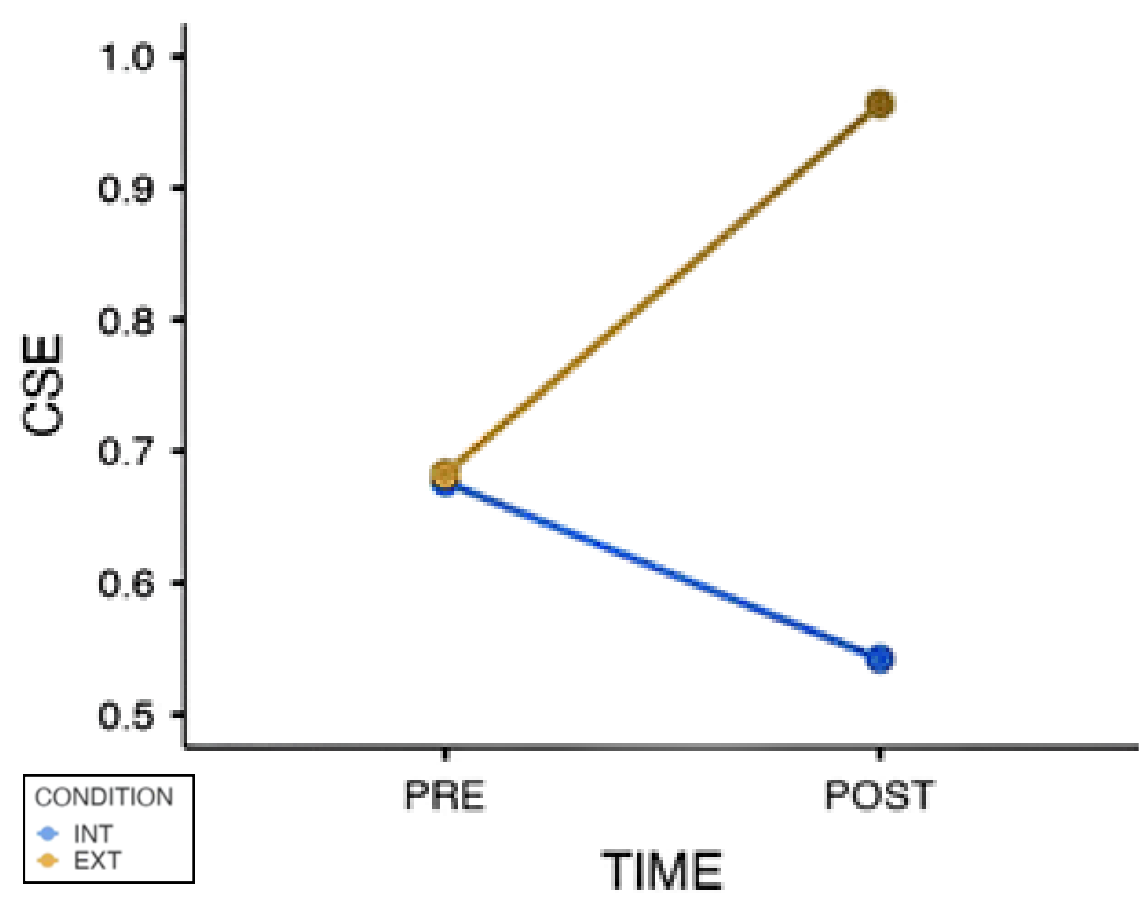
- ACL reconstruction (ACLR) often leads to quadriceps weakness due to neural inhibition and reduced corticospinal excitability¹.
- Early changes in SICI and ICF may contribute to neuromuscular dysfunction and re-injury risk^{2,4}.
- There is growing interest in neuroplasticity-focused rehab strategies^{2,4,6}.
- Attentional focus (external vs. internal) may influence motor recovery, but effects post-ACLR remain unclear^{2,4,6}.
- This study investigates how EF vs. IF affects motor cortex excitability during knee extension in ACLR individuals.

METHODS

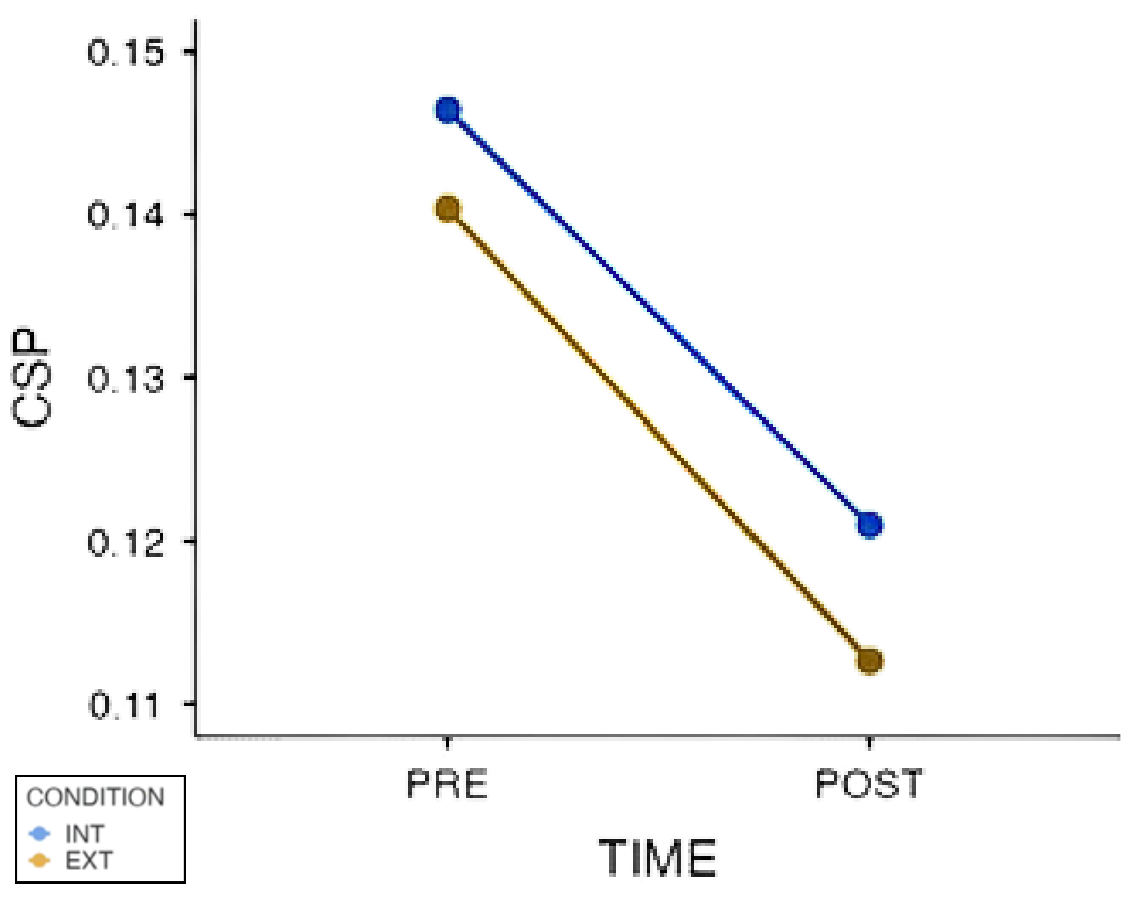
- Preliminary randomized crossover study;
- Three participants underwent two experimental sessions.



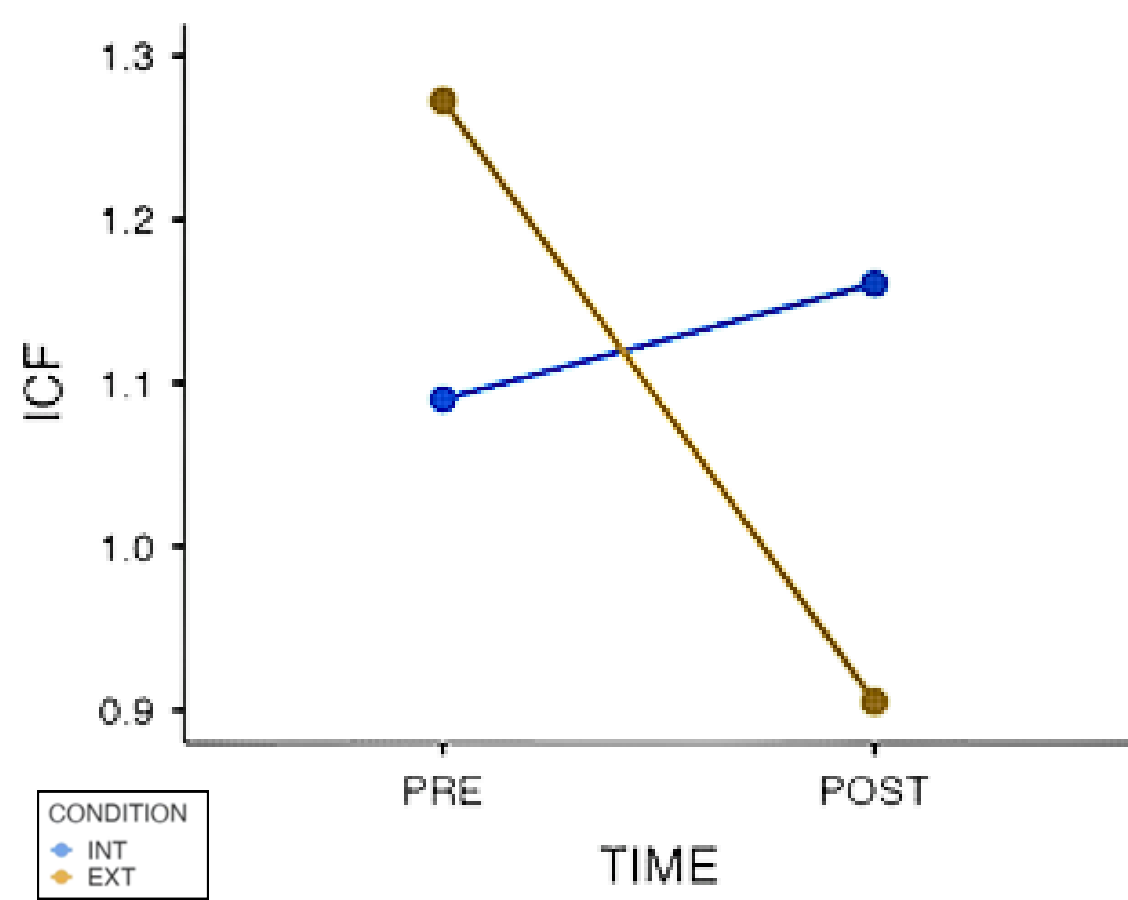
RESULTS



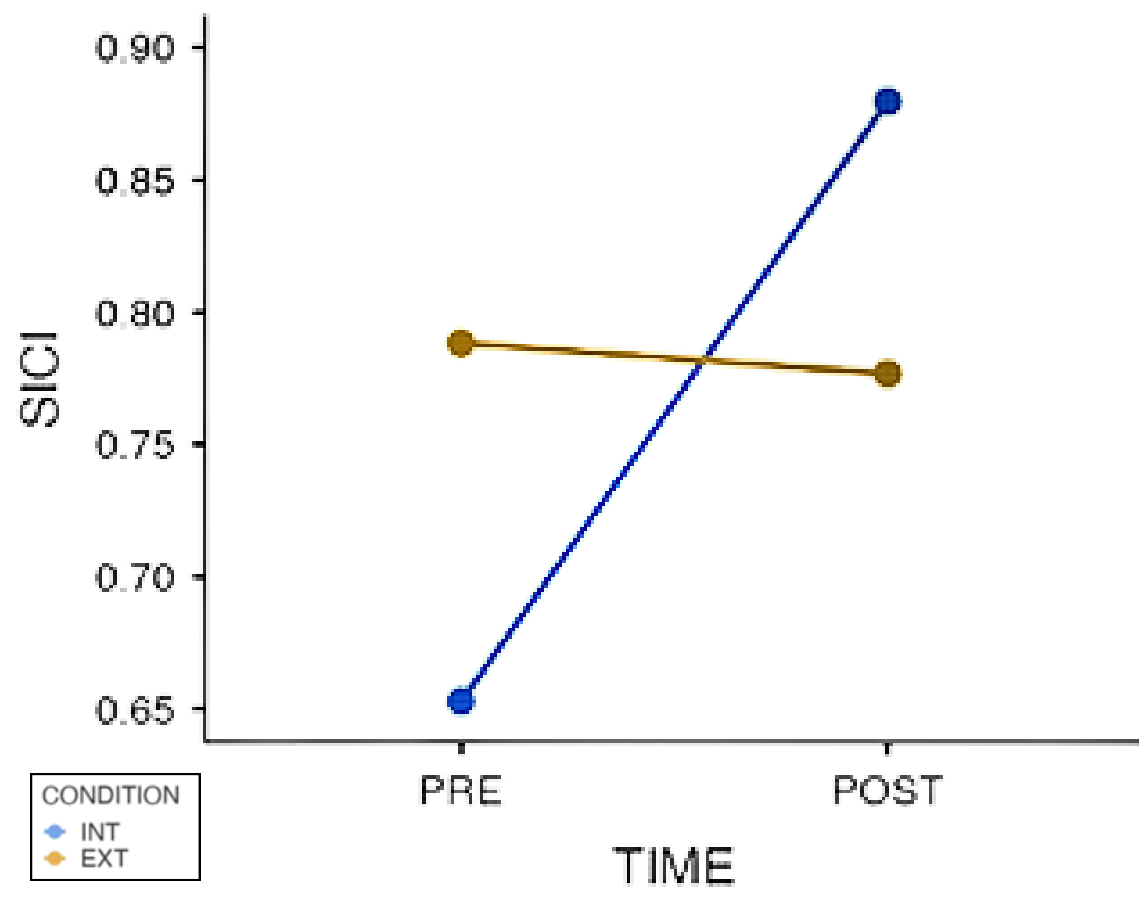
- EF appears to promote cortical activation



- Indicative of time-dependent neuromodulation



- Possible rebalancing of excitation/inhibition with EF



- IF may engage inhibitory circuits more

DISCUSSION

- External focus (EF) significantly increased corticospinal excitability (CSE) compared to internal focus (IF), indicating more effective motor pathway engagement.
- Unexpectedly, EF reduced intracortical facilitation (ICF) and had no significant effect on short-interval intracortical inhibition (SICI).
- In contrast, IF preserved or increased both SICI and ICF, suggesting a more balanced excitatory–inhibitory cortical environment.
- These findings highlight that attentional focus strategies modulate cortical circuits in a pathway-specific manner.
- EF appears to promote motor output, while IF may help regulate excitability through inhibitory mechanisms.
- The results support previous findings showing EF enhances neuromuscular control and movement efficiency².
- EF has also been shown to improve landing biomechanics and muscle performance⁴.
- Individuals post-ACLR exhibit early disruptions in excitatory–inhibitory balance, underscoring the need for early, targeted neuroplastic interventions³.
- Attentional focus is a powerful and modifiable variable that should be integrated into post-ACLR rehabilitation based on recovery stage.

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