

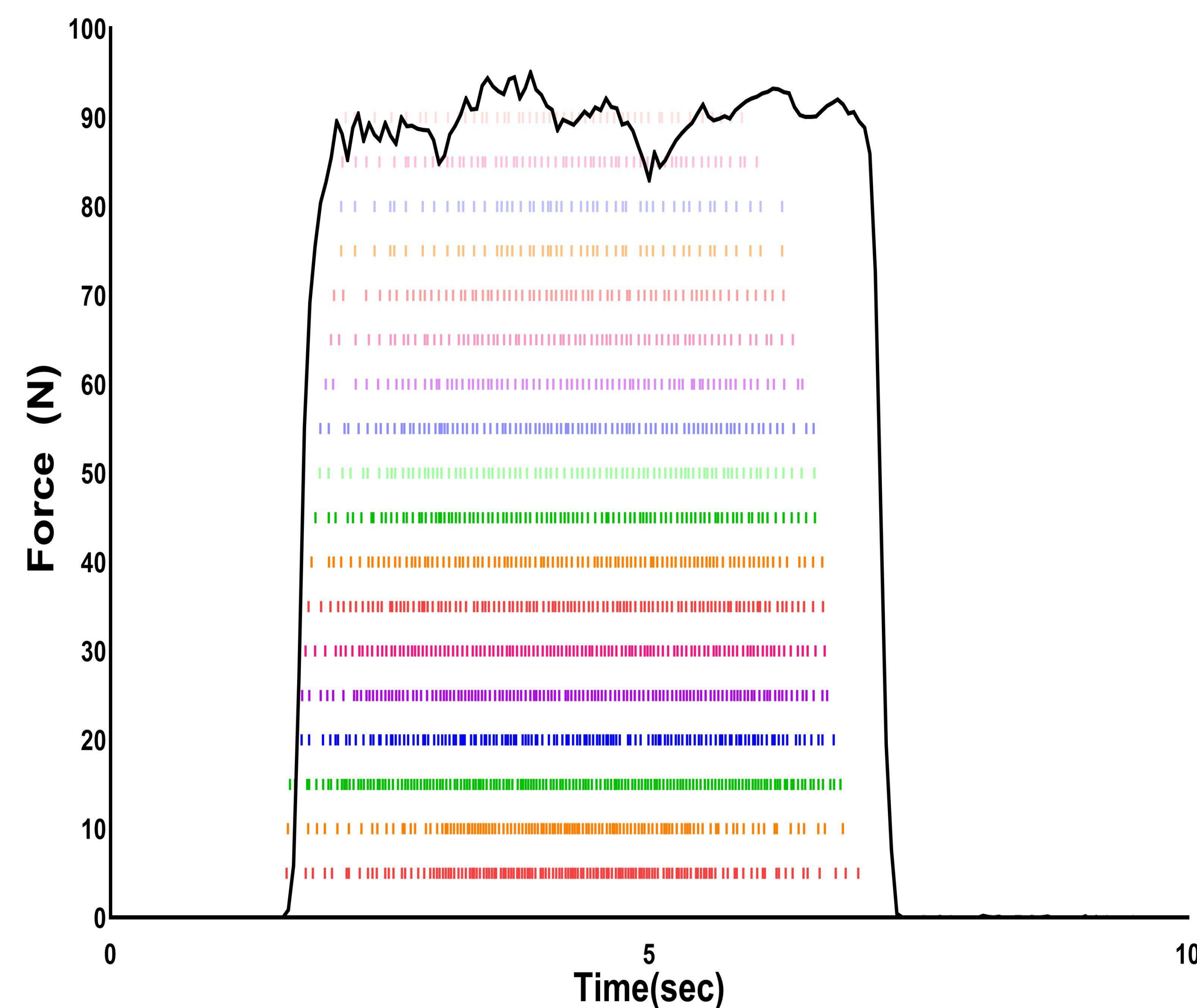


## PURPOSE

This study investigated strength and motor unit (MU) firing rates of the first dorsal interosseous (FDI) muscle during 2 training sessions in absence of a familiarization visit.

## METHODOLOGY

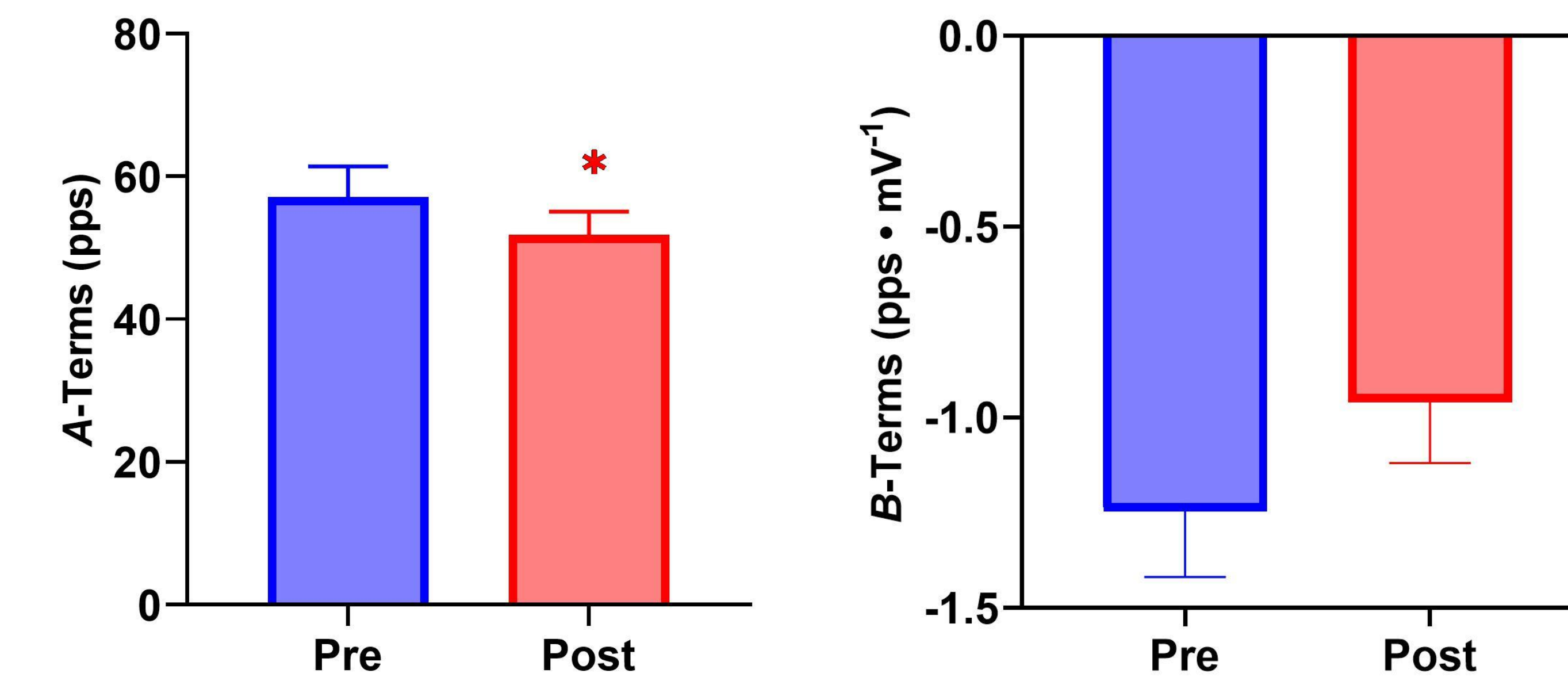
Thirteen college-aged females ( $20.1 \pm 1.2$  yrs;  $170.2 \pm 8.4$  cm;  $58.5 \pm 13.6$  kg) completed two lab visits. During each session, participants performed three isometric finger abduction MVCs. A visual demonstration was provided, but no physical practice occurred. A 5-pin EMG sensor array was placed over the FDI, and motor unit (MU) action potential trains were decomposed to calculate mean firing rates (MFR) and MU action potential amplitudes (MUAPamp). MFRs were analyzed during the steady-force plateau of each MVC. Exponential models were fit to the MFR vs. MUAPamp relationship, where  $A$  is the theoretical MFR (pps) at 0 mV,  $e$  is the natural constant, and  $B$  is the decay coefficient. Paired-sample t-tests compared  $A$ ,  $B$ , and MVC strength between visits, and Cohen's  $d$  effect sizes were calculated.



Females exhibit **non-uniform** alterations in motor unit recruitment strategies, despite no increase in absolute force, following a single session of repeated maximal isometric contractions.



## RESULTS



The  $A$  terms significantly decreased ( $p = 0.022$ ,  $d = 0.657$ ) with no significant changes in the slopes ( $p = 0.062$ ,  $d = -0.480$ ) from the 1<sup>st</sup> to 2<sup>nd</sup> training session. No changes in MVC strength were observed ( $p = 0.272$ ).

## CONCLUSION

There was no increase in FDI strength following 1 day of training. Interestingly, the  $A$  terms were lower suggesting that firing rates for the lower-threshold MUs decreased. There were no significant changes in  $B$  terms, however, the effect size suggests an increase that was moderate in magnitude. Together, changes in MU activation strategies may have occurred despite no changes in absolute force. Potentially, non-uniform changes in MU firing rates and/or recruitment might have occurred, such as, lower firing rates of smaller MUs that coincided with higher firing rates of the larger MUs.

## PRACTICAL APPLICATION

Adaptations to MU activation are plausible when performing an unfamiliar maximal RET session, even in the absence of strength changes.