

## Woodcock Research Grant Final Report

Project title: Neuro-efficiency: neural basis of perceived effort during movement

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The award started in Jan 2022 and we received IRB approval on December 4 2022.

**Project progress and results:** We have completed all data collection in April 2023. IRB closure was submitted in Summer 2023. The GRAs worked on data processing and data analysis in summer and fall 2023. We have completed analysis of behavioral and fNIRS data and the kinematic analysis is undergoing.

The results revealed negative significant correlation between brain activation during reaching and self-reported fatigue. Individuals with high levels of fatigue showed a reduced peak oxygenated hemoglobin concentration at left dorsolateral prefrontal cortex and left primary motor cortex.

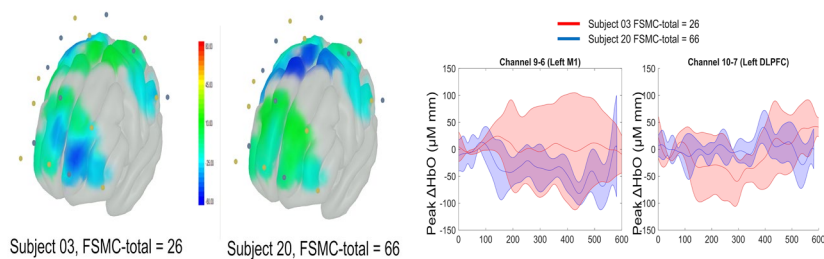


Figure 1. Oxygenated hemoglobin concentrations of two representative participants with different fatigue scores.

	FSMC-Motor		FSMC-Cognitive	
	Right Arm	Left Arm	Right Arm	Left Arm
Left DLPFC (N = 14)	0.24	<b>-0.67</b>	0.06	-0.39
Right DLPFC (N=14)	-0.12	-0.14	-0.37	-0.24
Left M1(N = 14)	0.20	-0.52	0.13	<b>-0.62</b>
Right M1 (N = 10)	-0.39	-0.16	-0.08	0.17
Left S1 (N=14)	-0.06	0.32	-0.08	0.29
Right S1(N=10)	-0.30	-0.57	-0.25	-0.42

DLPFC = dorsolateral prefrontal cortex; M1 = primary motor cortex; S1 = primary somatosensory cortex  
r = statistically significant correlation coefficient

Table 1. Correlation between self-reported fatigue and brain activation.

We submitted an abstract to American Physical Therapy Association Combined Sections Meeting and it was accepted as a poster presentation. The GRA Dreanna McAdams and Brooke Trunnell will present the poster in Boston February 2024. In addition, the students presented the work at TWU School of Physical Therapy Annual Research Day on November 29 2023. Manuscript submission is planned for spring 2024.

**Budgetary expenditure:** The balance of the grant dated on Dec 11 2023 is \$7272. We spent budgeted incentive and consultation fee. Two DPT GRAs also signed this project up for their critical inquiry courses and received academic credits. Hours they spent on course credits were not logged as expense. Lastly, PI Goh received another federal grant to support part of her salary; therefore budgeted faculty salary was not spent.