

Supplementary Information for:

Neurofeedback modulation of insula activity via MEG-based brain-machine interface: A double-blind randomized controlled crossover trial

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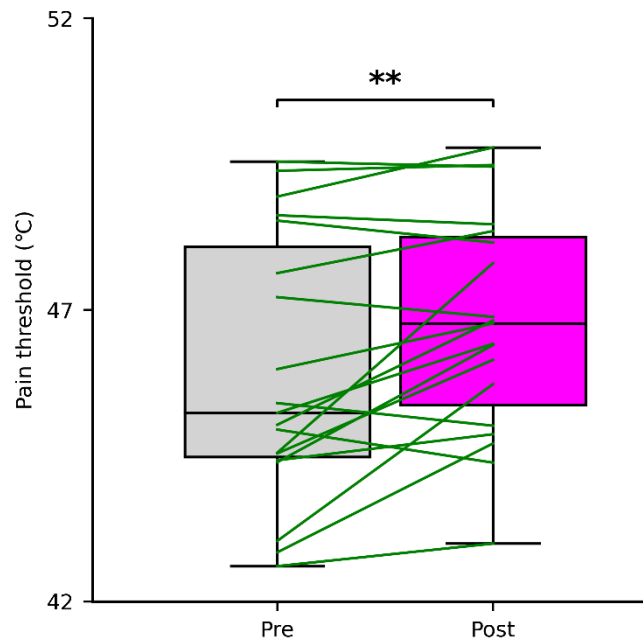
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Supplementary Table 1. Repeated Measures ANOVA Results for Modulation and

Pre-post Effects on the Pain Threshold.

Source	Sum of Squares	Degrees of Freedom (Num DF)	Denominator DF (Den DF)	F Value	P Value
Modulation	0.337	1	18	0.337	0.5688
Time	10.5213	1	18	10.5213	0.0045
Modulation × Time	0.2246	1	18	0.2246	0.6412

The effect of modulation (up vs. down) on the pain threshold was not statistically significant ($p = 0.5688$), whereas the effect of time (pre vs. post) was significant ($p = 0.0045$), indicating a change in the pain threshold over time. The interaction between modulation and time did not significantly affect the pain threshold ($p = 0.6412$), suggesting that the impact of modulation does not vary by time point.



Supplementary Figure 1. Effect of time on pain threshold.

Pain thresholds (the average of the thresholds for Upmodulation and Downmodulation experiment) pretraining (gray) was significantly lower than posttraining (magenta) ($t = -3.2437$, $p = 0.0045$; $n = 19$). All the data were analyzed by two-tailed paired Student's t tests with Bonferroni correction. Green lines connect data points from the same individual. Asterisks (*) denote statistically significant differences ($*p < 0.05$, $**p < 0.01$). In the boxplots, centerlines represent medians, the box limits represent the lower and upper quartiles, the whiskers represent 1.5 times the interquartile range.