

Supplementary Document for *Correlating active
and resting motor thresholds for transcranial
magnetic stimulation through a matching model*

Table S1: Selected studies including both AMT and RMT measurements from the first dorsal interosseous muscle.

Studies	Sample Size (F:M)	Device	Coil Type	Pulse Shape	Stimulated Hemi- sphere (Target Muscle)	% MVC	Hand Domi- nance
Di Lazzaro et al. [1]	7 F:3 M	Magstim 200 stimulator	Figure-of-eight	Monophasic	Left/Right M1 (FDI)	20 %	NG
Guerra et al. [2]	6 F:12 M	Magstim 200 stimulator	Figure-of-eight	Monophasic	Left M1 (FDI)	20 %	NG
Hamada et al. [3]	29 F:35 M	Magstim 200 ² stimulator	Figure-of-eight	Monophasic	Left M1 (FDI)	10 %	NG
Hand et al. [4]	8 F:25 M	Two Magstim 200 ² stimulators with a Bistim unit	Figure-of-eight	Monophasic	Left M1 (FDI)	10 %	NG
Hand et al. [5]	7 F:21 M	Two Magstim 200 ² stimulators with a Bistim unit	Figure-of-eight	Monophasic	Left M1 (FDI)	10 %	NG
Opie et al. [6]	2 F:9 M	Two Magstim 200 stimulators with a Bistim unit	Figure-of-eight	Monophasic	Left M1 (FDI)	5 – 10 %	Right-handed
Sasaki et al. [7]	10 F:21 M	Magstim Super Rapid stimulator	Figure-of-eight	Biphasic	Left M1 (FDI)	10 %	Right-handed
Wiethoff et al. [8]	33 F:20 M	Magstim 200 ² stimulator	Figure-of-eight	Monophasic	Left M1 (FDI)	10 %	Right-handed
Total Studies = 8;		Total Subjects = 248 (102 F:146 M);					

Note: (a) M1: the primary motor cortex, FDI: the first dorsal interosseous muscle; (b) Hemisphere: the target muscle is contralateral to the hemisphere being stimulated; (c) % MVC: the percentage of maximum voluntary contraction during AMT; (d) NG: not given; (e) Hamada et al. [3] provided unpublished data of MT measurements including extra 8 (5 F:3 F) subjects.

The present study follows the motor threshold measurement guidelines outlined by the International Federation of Clinical Neurophysiology. According to these guidelines, AMT is defined as the lowest stimulus strength that can produce MEPs of at least 200 μ V in about half of the trials during voluntary contraction of the target muscle at a certain percentage of the maximum voluntary contraction (MVC) and RMT is the lowest stimulus strength that can produce MEPs of at least 50 μ V in half of the stimuli in a relaxed target muscle [9]. In this study, the first dorsal interosseous (FDI) muscle was chosen as the target muscle, as it has been extensively used in previous studies that have measured both AMT and RMT [1, 2, 3, 4, 5, 6, 7, 8].

As listed in Table S1, this database has 248 subjects collected from eight different

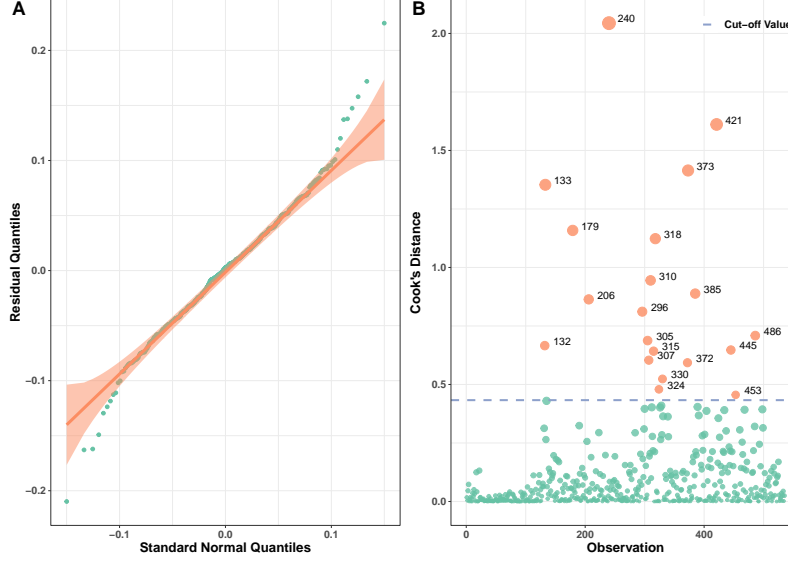


Figure S1: Illustration of the distribution of residuals and their corresponding Cook's Distance. (A) shows the standard quantile-quantile plot for the residuals of the calibrated model; (B) shows their Cook's distance and influential observations. The cut-off value is 4.5 times the residual mean, which is 0.433, in this study.

studies, which contains a number of 535 pairs of AMT and RMT in total, and contains five TMS devices coming from Magstim and reports their specifications in detail as well. Moreover, this dataset is very unbalanced in terms of PULSE SHAPE and STIMULATED HEMISPHERE. The calibrated model with the original database shows that the model residual distribution ($\epsilon_{ijk} \sim \mathcal{N}(0, 3.5 \cdot 10^{-3})$) violates the assumptions of homogeneity of variance ($F(247, 287) = 1.78$, $p = 1.25 \cdot 10^{-6}$, Levene's test) but the assumption of normality ($P = 27.757$, $p = 0.184$, Chi-square normality test). To ensure the residual distribution assumptions of normality and homogeneity of variance, we calculated Cook's Distance for each residual and identified those observations that have a Cook's Distance greater than 4.5 times the residual mean (i.e., the cut-off value) as outliers (shown in Figure S1). Therefore, there are in total 20 observations identified as outliers in this database. In conclusion, the amended database for calibration has in total 515 observations and 237 subjects coming from eight studies.

References

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