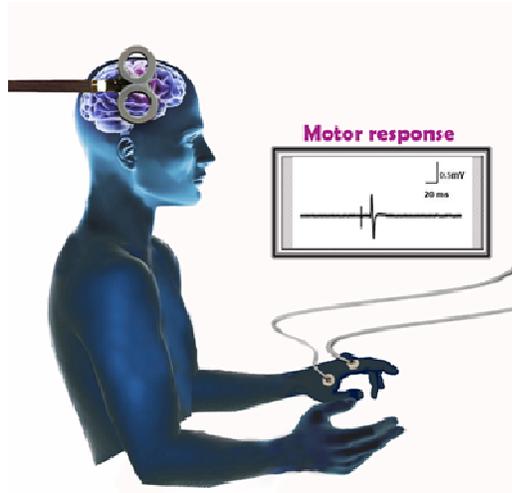


**Fig. S1:** Surface electromyography recordings from a right hand muscle. **(A)** A single test stimulus applied to the left motor cortex producing a motor evoked potential (MEP). **(B)** The cortical silent period induced following a 40% suprathereshold test stimulus applied to the left motor cortex while the right hand muscle is tonically activated. The cortical silent period starts at the onset of the MEP and ends with the return of motor activity. **(C)** Short interval cortical inhibition: a conditioning stimulus precedes the test stimulus by 2 ms and inhibits the MEP produced by the test stimulus. **(D)** Long interval cortical inhibition: the conditioning stimulus precedes the test stimulus by 100 ms and inhibits the MEP produced by the test stimulus. **(E)** Intracortical facilitation: the conditioning stimulus precedes the test stimulus by 20 ms, facilitating the MEP produced by the test stimulus.

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**Fig. S2:** A single transcranial magnetic stimulation pulse applied to the motor cortex activates cortical tissues associated with the first dorsal interosseous muscle. This activation elicits a motor evoked potential at the periphery, captured through electromyography.



**Fig. S3:** Illustration of recording brain activity from the dorsolateral prefrontal cortex (DLPFC) using transcranial magnetic stimulation–electroencephalography.

**Table S1: Summary of transcranial magnetic stimulation paradigms**

Paradigm	Definition	Neurotransmitter system involved
Cortical silent period	Measured by stimulating the contralateral motor cortex with a single suprathreshold pulse in a moderately tonically active muscle (i.e., 20% of maximum contraction), resulting in the interruption of voluntary muscle contraction. <sup>1,2</sup>	GABA <sub>B</sub>
Short interval cortical inhibition	A paired pulse paradigm, whereby a subthreshold conditioning stimulus is applied to the motor cortex before a suprathreshold test stimulus at ISIs between 1 and 4 ms. The subthreshold conditioning stimulus suppresses the MEP produced by the test stimulus. <sup>1,2</sup>	GABA <sub>A</sub>
Long interval cortical inhibition	The pairing of a suprathreshold conditioning stimulus followed by a suprathreshold test stimulus at long ISIs (e.g., 50–100 ms), resulting in inhibition of the MEP produced by the test stimulus. <sup>3,4</sup>	GABA <sub>B</sub>
Interhemispheric inhibition	Measured using 2 magnetic stimulating coils, whereby a suprathreshold TMS pulse delivered to one hemisphere can inhibit the MEP response to a suprathreshold TMS pulse delivered within 6–50 ms to the opposite hemisphere. <sup>5,6</sup>	GABA <sub>B</sub>
Resting motor threshold	Defined as the minimal intensity (single pulse) that produces an MEP > 50 µV in 5 of 10 trials in a relaxed muscle. <sup>1</sup>	Glutamate
Active motor threshold	Defined as the first intensity (single pulse) that produces an MEP of > 100 µV in 5 of 10 trials in an isometrically moderately active muscle. <sup>7</sup>	Glutamate
Intracortical facilitation	A paired pulse paradigm that can be used to index excitability of the excitatory circuits in the motor cortex, whereby conditioning stimuli are applied to the motor cortex before the test stimulus, usually at ISIs between 7 and 20 ms. <sup>8</sup>	Glutamatergic NMDA receptors

GABA =  $\gamma$ -aminobutyric acid; ISI = interstimulus interval; MEP = motor-evoked potential; NMDA = *N*-methyl-D-aspartate; TMS = transcranial magnetic stimulation.

**Table S2: Summary of significant transcranial magnetic stimulation findings in psychiatric populations**

Disorder	Main findings
Schizophrenia	Impairments in CSP, short interval cortical inhibition and interhemispheric inhibition. <sup>9-11</sup> Two studies have shown that clozapine-treated patients demonstrated potentiated cortical silent periods. <sup>12,13</sup> Patients with a history of comorbid cannabis abuse show decreased short interval cortical inhibition and increased intracortical facilitation. <sup>14</sup> Patients demonstrated deficits in $\gamma$ inhibition of the DLPFC using long interval cortical inhibition with combined TMS and electroencephalography. <sup>15</sup>
Bipolar disorder	Impairments in the cortical silent period, short interval cortical inhibition and interhemispheric inhibition. <sup>16</sup>
Major depressive disorder	Deficits in the cortical silent period and short interval cortical inhibition. <sup>17-20</sup> Impairments in resting motor threshold and intracortical facilitation. <sup>19</sup>
Obsessive-compulsive disorder	Decreased cortical silent period and short interval cortical inhibition and enhanced intracortical facilitation. <sup>21-23</sup>

DLPFC = dorsolateral prefrontal cortex; TMS = transcranial magnetic stimulation.

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