nature portfolio

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Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our Editorial Policies and the Editorial Policy Checklist.

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed	
☐	☒	The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☐	☒	A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒	The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☐	☒	A description of all covariates tested
☐	☒	A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒	A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☐	☒	For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☒	☐	For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐	For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☐	☒	Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	Data were collected via REDCap.
Data analysis	The described analysis was done in IBM SPSS V26.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our policy

The data that support the findings of this study are available upon reasonable request from the senior authors NW and DS.

Human research participants

Policy information about studies involving human research participants and Sex and Gender in Research.

Reporting on sex and gender	Gender was based on participants' self-report.
Population characteristics	See behavioral & social studies section.
Recruitment	Recruitment was done via online advertisement, local flyers at the Stanford Medical School clinics, and at community events. Participants were individuals with fibromyalgia syndrome (following the American College of Rheumatology Preliminary Diagnostic Criteria) currently experiencing pain.
Ethics oversight	The study was approved by the Stanford University Institutional Review Board (IRB), and all participants provided informed consent.

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	Preregistered, double-blinded, randomized controlled trial (quantitative).
Research sample	A random sample of patients with fibromyalgia syndrome (FMS), a functional pain disorder for which hypnosis has consistently been shown to be beneficial as a nonpharmacological treatment option. All participants were TMS-naïve.
Sampling strategy	Preregistered, double-blinded, randomized controlled trial. Power was calculated for main hypothesis of greater pre/post-rTMS change in a neurobehavioural trait (hypnotizability) in the active (experimental) compared to sham (control) stimulation.
Data collection	Data were collected by trained assessors on pen & paper, then coded on REDCap data management system. Data analysis was done in SPSS V.26.
Timing	Data were collected between February 2017 and December 2019.
Data exclusions	No data were excluded from the analyses.
Non-participation	Overall, 101 participants were recruited, and 21 participants did not complete the full study protocol. A detailed COSORT diagram is provided in the manuscript (Figure 2).
Randomization	Participant were randomly allocated to either Active (experimental) or Sham (control) simulation groups. Assessors, participants, and statisticians were all blinded to group assignment. Only TMS technicians were not blinded to group assignment (they entered either active stimulation or sham stimulation codes to the TMS, based on random assignment).

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☐	☒ Clinical data
☒	☐ Dual use research of concern

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Clinical data

Policy information about clinical studies

All manuscripts should comply with the ICMJE guidelines for publication of clinical research and a completed CONSORT checklist must be included with all submissions.

Clinical trial registration	ClinicalTrials.gov NCT02969707
Study protocol	Available on ClinicalTrials.gov.
Data collection	Data were collected at Stanford University between February 2017 and December 2019.
Outcomes	This study addresses the hypnotizability-related outcomes of Secondary Objective B, one of five secondary objectives in the preregistered protocol.