

Corresponding author(s): Lennart LuettgauLast updated by author(s): Oct 6, 2023

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
<i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i> |
| ☐ | ☒ | 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
<i>Give P values as exact values whenever suitable.</i> |
| ☐ | ☒ | 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 analysis

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](#)

Behavioral and simulation data used to generate the results and figures in this paper will be made available on GitHub upon publication.

Research involving human participants, their data, or biological material

Policy information about studies with [human participants or human data](#). See also policy information about [sex, gender \(identity/presentation\), and sexual orientation](#) and [race, ethnicity and racism](#).

Reporting on sex and gender	Sex and gender were not considered in the study design, sex and gender were determined based on self-report.
Reporting on race, ethnicity, or other socially relevant groupings	Race, ethnicity, or other socially relevant groupings were not assessed.
Population characteristics	See above
Recruitment	Participants were recruited online via Prolific (https://www.prolific.co/). Self-selection biases cannot be ruled out, but are unlikely to affect the results.
Ethics oversight	The study was approved by the University College London Research Ethics Committee (reference number: 6649/004) and conducted in accordance with the Declaration of Helsinki.

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	Quantitative, experimental study
Research sample	Participants were recruited online via Prolific (https://www.prolific.co/). We included N = 238 participants for final analyses (median age: 28 years, SD = 10.61, range = 18 – 70, 139 males), N = 119 subjects per condition. The sample is not representative.
Sampling strategy	Participants were recruited online via Prolific (https://www.prolific.co/). Only participants indicating an absence of past or present mental health condition, an absence of any neurological conditions, and minimum approval rates >95% in previous experiments on Prolific were included. There were no location-based restrictions to participation. We did not perform a formal power calculation to determine sample size but based the chosen number of recruited participants on sample sizes in previous online studies conducted in our lab
Data collection	Participants were recruited online via Prolific (https://www.prolific.co/) and participated in the study between June 6th and 7th 2022. Upon declaring interest in participating in the study, participants were linked to Gorilla (https://app.gorilla.sc/), an online experiment builder that hosted the experiment and questionnaires. Participants performed the experiments on computers and were instructed to do so in a quiet environment. Researchers were blind to experimental conditions during data collection (automated in Prolific).
Timing	Data was collected between June 6th and 7th 2022
Data exclusions	Participants had to achieve at least 70% correct responses during a training session and were allowed to retake the training one further time (N = 5). If they did not surpass the threshold 70 % correct responses in this second attempt, they were excluded from the study (N = 1). In total, 239 healthy volunteers were included in the sample. One participant was excluded from statistical analyses due to having >10% missing responses overall in probe questions, leaving a total of N = 238 participants for final analyses
Non-participation	A total of 266 participants took part in the study, with 239 submissions included in the final sample (N = 1 rejected due to providing a wrong completion code and finishing the study unreasonably fast, N = 7 for timed-out sessions, N = 16 did not pass an initial quiz about the experiment, N = 1 did not meet the training performance criterion in two attempts, N = 2 participants reported experiencing malfunctions during the task, e.g. long temporal lags between images, program not recording responses).
Randomization	Participants were randomly assigned to each condition (between-subjects design)

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
☒	☐ Plants

Methods

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

Plants

Seed stocks

N/A

Novel plant genotypes

N/A

Authentication

N/A