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	All data was collected from manuscripts published between 2018 and 2020 in Science, Nature, Journal of Ecology, Ecology, and Ecology Letters.
Data analysis	All data manipulation were done in R version 4.0.0 70, and we utilized the 'here' package (version 1.0.1) for replicability. Throughout our script, we used dplyr (version 1.0.7) and tidyr (version 1.1.4) to manipulate our data. We also relied on ggplot2 (version 3.3.5), ggpubr (version 0.4.0), patchwork (version 1.1.1), and scales (version 1.1.1) for making figures. Our code is available at https://osf.io/9yd2b/?view_only=d3e18f3437bf49289cc5448d9e5a2e36.

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](#)

> Our dataset is available at https://osf.io/9yd2b/?view_only=d3e18f3437bf49289cc5448d9e5a2e36.

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	NA
Reporting on race, ethnicity, or other socially relevant groupings	NA
Population characteristics	NA
Recruitment	NA
Ethics oversight	NA

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](#)

Ecological, evolutionary & environmental sciences study design

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

Study description	We conducted a meta-science study whereby we estimated statistical power, exaggeration bias, and selective reporting from estimates reported in published studies.
Research sample	Our sample comprised peer-reviewed empirical ecology manuscripts published between 2018 and 2020 in Science, Nature, Ecology, Journal of Ecology, and Ecology Letters.
Sampling strategy	We collected estimates from empirical papers where data were reported in tables. We aimed to get a sample size >15,000 estimates so that our analysis would be robust based on a similar paper published in environmental economics.
Data collection	Data was recorded from empirical studies that statistically estimated parameters. Means and some measure of error needed to be reported. Data were collected by six undergraduate research assistants.
Timing and spatial scale	We collected data from papers published between 2018-2020.
Data exclusions	From the 1,568 papers in the five journals between our target years, we excluded 1,038 that did not report statistical tests in tables. We excluded 136 that were either meta-analyses or not empirical. 15 papers were removed that did not report errors and another 3 were removed that reported 0 for a standard error. One paper was removed because it was duplicated in 2019 and one was removed because the supplemental materials where tables may have been located did not work. 17 complete papers were removed because we could not discern sample sizes for any of the tests. When checking our sampled data, one paper was removed because it should not have been classified as an ecology topic from Science. During data processing, we removed one publication that had over 6,000 estimates and one was removed when we discarded the top percentile of t-statistics.
Reproducibility	This is not applicable to our study.
Randomization	This is not applicable to our study.

Blinding	This is not applicable to our study.

Did the study involve field work? ☐ Yes ☒ No

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