

Reporting Summary

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Statistical parameters

When statistical analyses are reported, confirm that the following items are present in the relevant location (e.g. 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
- An indication of 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 statistics 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
- Clearly defined error bars
State explicitly what error bars represent (e.g. SD, SE, CI)

Our web collection on [statistics for biologists](#) may be useful.

Software and code

Policy information about [availability of computer code](#)

Data collection

Data of all experiments in the study were collected using the web-based Enterprise Feedback Suite (EFS) by Questback.

Data analysis

For data analysis of single studies (Supplementary Information), we used IBM SPSS 23 for Mac OS X. For analysis of meta results and forest plots (manuscript) we used review manager 5.3 from the Cochrane Collaboration. In addition we used Meta Essentials to calculate meta effect-sizes of repeated measures. For bar and dot plots (manuscript and supplement) we used the R-package ggplot2. For a-priori statistical power analysis we used G*Power 3.1.9.2 (Experiment 1 and Experiment 2) and 3.1.9.3 (Experiment 3, 4, 5 and 6) for Mac OS X. Statistical power for meta-analyses were calculated using the R-Script by Tiebel.

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/reviewers upon request. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Research [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 list of figures that have associated raw data
- A description of any restrictions on data availability

The data supporting the findings of this study are available from the Open Science Framework with the identifier doi: 10.17605/OSF.IO/XX2KT57.

Field-specific reporting

Please select 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/authors/policies/ReportingSummary-flat.pdf](https://www.nature.com/authors/policies/ReportingSummary-flat.pdf)

Behavioural & social sciences study design

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

Study description	All experiments in the study are quantitative experimental.
Research sample	<p>Experiment 1: University of Erfurt undergraduates. (Age: Mean = 22.81, Standard Deviation = 4.10; Gender: 84% female; Education: 99% reported a university entrance diploma or a higher education; Nationality: German)*. Reason for sample selection: Pilot experiment.</p> <p>Experiment 2: Participants from panel survey company. Representative of the general German population with regard to age, gender and education. (Age: M = 49.58, SD = 14.70; Gender: 54% female; Education: 40% reported a university entrance diploma or a higher education; Nationality: German)*. Reason for sample selection: Replication in a more heterogeneous, non-student sample.</p> <p>Experiment 3: Participants from panel survey company. (Age: M = 50.90, SD = 15.90; Gender: 55% female; Education: 42% reported a university entrance diploma or a higher education; Nationality: German)*. Reason for sample selection: Replication in a more heterogeneous, non-student sample.</p> <p>Experiment 4: Amazon Mechanical Turk Worker. (Age: M = 39.43, SD = 12.02; Gender: 47% female; Education: 74% reported an associate's degree or a higher education; Nationality: US-citizen)*. Reason for sample selection: Replication in a heterogeneous, English-speaking sample.</p> <p>Experiment 5: University of Erfurt undergraduates. (Age: M = 29.14, SD = 12.08; Gender: 62% female; Education: 87% reported a university entrance diploma or a higher education; Nationality: German)*. Reason for sample selection: Replication of Experiment 1 in a similar sample but different subject domain.</p> <p>Experiment 6: Amazon Mechanical Turk Worker. (Age: M = 36.81, SD = 10.92; Gender: 46% female; Education: 71% reported an associate's degree or a higher education; Nationality: US-citizen)*. Reason for sample selection: Replication in a sample of US residents.</p> <p>*All demographic data are provided for final samples after application of exclusion criteria (see below).</p>
Sampling strategy	<p>Experiment 1: Convenience sampling procedure.</p> <p>Experiment 2: Quota (by age, gender and education of the German general population) sampling procedure; preregistered sample size based on a priori statistical power calculations (Power = 0,8) for all analyses. See https://aspredicted.org/3hv7m.pdf for preregistration files.</p> <p>Experiment 3: Quota (by age, gender and education of the German general population) sampling procedure; preregistered sample size based on a priori statistical power calculations (Power = 0,8) for all analyses. See https://aspredicted.org/ve6hv.pdf for preregistration files.</p> <p>Experiment 4: Convenience sampling procedure; preregistered sample size based on a priori statistical power calculations (Power = 0,95) for all analyses. See https://aspredicted.org/bf9qe.pdf for preregistration files.</p> <p>Experiment 5: Convenience sampling procedure; preregistered sample size based on a priori statistical power calculations (Power = 0,8) for all analyses. See https://aspredicted.org/ce2am.pdf for preregistration files.</p> <p>Experiment 6: Convenience sampling procedure; preregistered sample size based on a priori statistical power calculations (Power = 0,8) for all analyses. See https://aspredicted.org/ij55n.pdf for preregistration files.</p>
Data collection	Data of all experiments in the study were collected using the web-based Enterprise Feedback Suite (EFS) by Questback. Data was stored

Data collection	and analyzed on a computer. Owing to the automatic randomization mechanism (see below), the investigators were blind to the group allocation process.
Timing	Experiment 1: 11.03.2016 - 08.04.2016 Experiment 2: 07.04.2017 - 19.04.2017 Experiment 3: 15.09.2017 - 16.10.2017 Experiment 4: 09.04.2018 - 13.04.2018 Experiment 5: 05.07.2017 - 31.07.2017 Experiment 6: 27.11.2018 - 29.11.2018
Data exclusions	Participants under the age of 18 were screened out at the beginning of all experiments. The following exclusion criteria were preregistered for Experiments 2–6: Participants were excluded when they did not finish the experiment, when the duration of participation exceeded 30 minutes or fell below five minutes (Experiment 5: three minutes) and when participants failed to answer a simple attention check. All exclusion criteria were applied to increase quality of responses in online experiments. The attention check for all experiments was a single choice question about the content of the discussion that they had read or heard depending on the experiment (see Supplementary Table 6 for wording). The attention check was not preregistered in Experiment 5 by mistake. We still applied this exclusion criterion to align the quality of results with those of the previous four experiments. We also applied these exclusion criteria to Experiment 1.
Non-participation	Experiment 1: N = 202 participants clicked on the link of the study, 168 proceeded after the introduction page and 125 finished the experiment. The exclusion of 13 participants due to the exclusion criteria (see above) resulted in a sample size of n = 112 for all analyses. Experiment 2: N = 260 participants clicked on the link of the study, 238 proceeded after the introduction page and 206 finished the experiment. The exclusion of 42 participants due to the exclusion criteria (see above) results in a sample size of n = 164 for all analyses. Experiment 3: N = 383 clicked on the link of the study, 333 proceeded after the introduction page and 261 finished the experiment. The exclusion of 60 participants due to the exclusion criteria (see above) results in a sample size of n = 201 for all analyses. Experiment 4: N = 345 clicked on the link of the study, 276 proceeded after the introduction page and 256 finished the experiment. The exclusion of 29 participants due to the exclusion criteria (see above) results in a sample size of n = 227 for all analyses. Experiment 5: N = 1,149 clicked on the link of the study, 339 proceeded after the introduction page and 217 finished the experiment. The exclusion of 69 participants due to the exclusion criteria (see above) results in a sample size of n = 148 for all analyses. Experiment 6: N = 2105 clicked on the link of the study, 1416 proceeded after the introduction page and 1137 finished the experiment. The exclusion of 216 participants due to the exclusion criteria (see above) results in a sample size of n = 921 for all analyses.
Randomization	Participants of all experiments in the study were randomly allocated to one out of four experimental conditions. An automatic randomization mechanism provided by the Enterprise Feedback Suite (see above) was used for randomization. At the start of the study the software randomly selected which rebuttal information was to be communicated to participants.

Reporting for specific materials, systems and methods

Materials & experimental systems

n/a	Involved in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/> Unique biological materials
<input checked="" type="checkbox"/>	<input type="checkbox"/> Antibodies
<input checked="" type="checkbox"/>	<input type="checkbox"/> Eukaryotic cell lines
<input checked="" type="checkbox"/>	<input type="checkbox"/> Palaeontology
<input checked="" type="checkbox"/>	<input type="checkbox"/> Animals and other organisms
<input type="checkbox"/>	<input checked="" type="checkbox"/> Human research participants

Methods

n/a	Involved in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/> ChIP-seq
<input checked="" type="checkbox"/>	<input type="checkbox"/> Flow cytometry
<input checked="" type="checkbox"/>	<input type="checkbox"/> MRI-based neuroimaging

Human research participants

Policy information about [studies involving human research participants](#)

Population characteristics	see above
Recruitment	Participants were recruited via Email (Experiment 1 and 5) or via a direct link to the study provided by Amazons Mechanical Turk (Experiment 4 and 6), the survey company Norstat (Experiment 2 and 3) or social media (Experiment 5). All experiments were conducted online. Participation was a voluntary decision and participants could quit the survey at any time. Therefore, individuals intrinsically interested in the topic of the survey could have been more willing to finalize the study. We tried to reduce this potential bias with adequate compensation of participants. Moreover, it could be assumed that highly educated people are more willing to participate in surveys about the topic of this study (vaccination, climate change). We addressed this potential bias with samples representative of the German general population with regard to education (Experiment 2 and 3).