

Sexual selection improves population fitness: a systematic review and meta-analysis

Response to Editorial Requests

Dear Dr. Jones and colleagues,

We are delighted to provide a revised manuscript for publication in *Nature Communications*. Below we provide a point-by-point response to the editorial requests as well as a response to comments by Prof. Jacek Radwan.

Editorial Requests

1. *Please supply the main manuscript file in Microsoft Word or LaTeX format. Please supply a Supplementary Information file in PDF format.*

The main manuscript is provided in LaTeX format (.tex) and the Supplementary Information is now in pdf format. However, we retain the HTML formatting for the Supplementary Information hosted on [Github](#).

2. *Please edit the title so that it is 15 words or fewer and does not include punctuation*
<!-- Sexual selection improves population fitness based on a systematic review and meta-analysis -->
We have changed our title to: Meta-analytic evidence that sexual selection improves population fitness

3. *The final paragraph of the Introduction should summarise the major results and conclusions of this manuscript, in the present tense.*

<!-- We had previously included this in an earlier draft and cut it. Can add it back -->

4. *Please shorten all subheadings in the Results section to fewer than 60 characters including spaces.*

Sexual selection is associated with higher mean values for most fitness components **to** Sexual selection improves average fitness for most traits.

Sexual selection reduces phenotypic variance, for female traits in stressful environments **to** Effects of sexual selection on phenotypic variance

5. *Please do not use italics or bold font to convey emphasis (in both the main text and the display items).*
Is this the latin? (e.g. /Prima facie / Tabbles have bold, figures have bold...)

6. *Please avoid using speech marks around words or phrases. In most cases they are unnecessary.*

Speech marks around the following words/phrases have now been removed: population fitness (1.21), purged (1.175), softer (1.199), harder (1.199), 'good genes' (1.243), attractive (1.244), unambiguous (1.359).

Single quotes for technical terms

7. *Please make sure that mathematical terms throughout your manuscript and Supplementary Information (including in figures, figure axes, and legends) conform strictly to the guidelines*

Not sure where we went wrong here?

8. *Wherever p-values are stated in the text and figure legends, please also state the name of the statistical test.*

A couple of linear models in the publication bias section have p values without stating it is a linear regression. Otherwise we don't have that many p values and it is described in the table as from a multilevel meta-analysis model.

9. *Please provide a full Methods section in the main manuscript file. Please note that there are no word limits to the Methods section. The Methods section must include subheadings of fewer than 60 characters including spaces. There is no word limit for the Methods section, so we recommend against splitting the methods description between the main text and Supplementary Information.*

All headings are under 60 characters in length, we have some additional Supp Methods in the Supp info but it is more or an appendage to the Supp tables and search terms (which would not nicely format in the main text)

10. *Please rename the Methods section as "Methods".*

Done

11. *All Nature Communications manuscripts must include a section titled "Data Availability" as a separate section after the Methods section and before the References.*

We have now ammended this section of the manuscript by seperating data availability and code availability as well as providing the relevent links to the data sources hosted on github.

12. *We strongly encourage authors to deposit all new data associated with the paper in a persistent repository where they can be freely and enduringly accessed.*

We have chosen to host our data on a github repository alongside all our code and a neatly formatted html with supplementary information in an effort to maximise transparency of our analysis as well as allowing for the data and code to be easily reproduced and built upon by future studies.

13. *For all studies developing new software or using custom code in the generation or processing of datasets, a statement must be included in the Methods section, under the subheading "Code Availability", indicating whether and how the code can be accessed, including any restrictions to access. This section should also include information on the versions of any software used, if relevant, and any specific variables or parameters used to generate, test, or process the current dataset.*

Done. The Supplementary information has a section at the end with 'R Session Information', which provides details of the attached packages and parameters of the operating system.

14. *Please add a reference to the source data file in the "Data Availability" section*

Done. The repository now also contains a more extensive 'READ ME', with a description of the repository organisation.

15. *End notes*

Acknowledgements, Author Contributions and Competing Interests are now found after the references.

16. *Please update any preprints in the reference list with details of the published paper, if possible.*

We have changed one reference that was a preprint and is now published (Li and Holman 2018).

17. *Please check whether your manuscript or Supplementary Information contain third-party images, such as figures from the literature, stock photos, clip art or commercial satellite and map data.*

No third-party images are included in the display items.

18. *Please include a brief title for all figure legends that summarises the whole figure and does not refer to specific panels and Please ensure that figure legend titles are brief - they should not occupy more than one line in the final proof.*

Figure titles are now included and illustrated in bold at the start of the figure legend. They do not occupy more than one line.

19. *Please include figure legends of up to 350 words, referring to all panels within the figure.*

No figure legends are above 350 words and in all cases all panels are referred to in the legend.

20. *Data in tables must be free from bold/italic formatting unless this has been clearly defined in the footnote. Tables need to be black and white, fit onto a single A4 portrait page and can contain only one row of column titles. Finally, we are unable to merge cells or include vertical dividing lines or diagonal lines. Please format your tables accordingly.*

Bolding in tables are now clearly defined in the footnotes, the tables are formatted in latex, contain one row of column titles and are in black and white.

21. *Please ensure that table titles are brief - they should not occupy more than one line in the final proof.*

Done

Response to Prof. Jacek Radwan