ANIMAL BEHAVIOUR

DESCRIPTION

First published in 1953, Animal Behaviour is a leading international publication and has wide appeal, containing critical reviews, original papers, and research articles on all aspects of animal behaviour. Book Reviews and Books Received sections are also included.

Growing interest in behavioural biology and the international reputation of Animal Behaviour prompted an expansion to monthly publication in 1989. Animal Behaviour continues to be the journal of choice for biologists, ethologists, psychologists, physiologists, and veterinarians with an interest in the subject.

Research Areas include:
• Behavioural ecology
• Evolution of behaviour
• Sociobiology
• Ethology
• Behavioural psychology
• Behavioural physiology
• Population biology
• Sensory behaviour
• Navigation and migration

AUDIENCE

Behaviourists, behavioural ecologists, behavioural neuroscientists, ethologists, evolutionary ecologists

IMPACT FACTOR

2017: 3.067 © Clarivate Analytics Journal Citation Reports 2018

ABSTRACTING AND INDEXING

Scopus
EMBiology
EDITORIAL BOARD

Executive Editors
Susan Healy, University of St Andrews, Fife, UK
Nancy G. Solomon, Miami University, Oxford, Ohio, USA

Editors
S. Dalesman, Aberystwyth University, Aberystwyth, UK
M.L. Dyson, The Open University, Milton Keynes, England, UK
D. Farine, Max Planck Institute (MPI) for Ornithology, Seewiesen, Germany
M. Ferkin, University of Memphis, Memphis, Tennessee, USA
T.M. Freeberg, University of Tennessee - Knoxville, Knoxville, Tennessee, USA
M. Goubault, Université François-Rabelais de Tours, Tours, France
J.P. Higham, New York University, New York, New York, USA
R. Holland, Bangor University, Bangor, Wales, UK
A.G. Horn, Dalhousie University, Halifax, Nova Scotia, Canada
D. Jennings, Newcastle University, Newcastle Upon Tyne, England, UK
J. Johnson, Arizona State University West, Glendale, Arizona, USA
A Korstjens, Bournemouth University, Poole, UK
E. Leadbeater, Royal Holloway, University of London, Egham, UK
M. Leal, University of Missouri, Columbia, Missouri, USA
S. MacDougall-Shackleton, University of Western Ontario, London, Ontario, Canada
N. Marples, University of Dublin, Trinity College, Dublin, Ireland
H. Marshall, Roehampton University, London, England, UK
O. Martin, ETH Zürich, Zurich, Switzerland
A. McGregor, Durham University, Durham, UK
K. Nakata, Kyoto Women's University, Higashiyama-ku, Kyoto, Japan
M. Polak, University of Cincinnati, Cincinnati, Ohio, USA
E. Robinson, University of York, York, UK
K.E. Ruckstuhl, University of Calgary, Calgary, Alberta, Canada
R.L. Rutowski, Arizona State University, Tempe, Arizona, USA
T.N. Sherratt, Carleton University, Ottawa, Ontario, Canada
R. Thorogood, University of Cambridge, Cambridge
B. Voelkl, Universität Bern, Bern, Switzerland
C. Wascher, Anglia Ruskin University, Cambridge, England, UK
M. Webster, University of St Andrews, Fife, UK
A.E. Wignall, Massey University, Auckland, New Zealand
M.A. Wund, The College of New Jersey, Ewing, New Jersey, USA

Managing Editors
Kris Bruner, Indiana University, Bloomington, Indiana, USA
Angela Turner, University of Nottingham, Nottingham, England, UK

Ethics Editors
D. Jennings, Newcastle University, Newcastle Upon Tyne, England, UK
A.G. Ophir, Cornell University, Ithaca, New York, USA

Editorial Assistant
J. Fox, University of Nottingham, Nottingham, England, UK
GUIDE FOR AUTHORS

Your Paper Your Way
We now differentiate between the requirements for new and revised submissions. You may choose to submit your manuscript as a single Word or PDF file to be used in the refereeing process. Only when your paper is at the revision stage, will you be requested to put your paper in to a 'correct format' for acceptance and provide the items required for the publication of your article.

To find out more, please visit the Preparation section below.

INTRODUCTION

Types of article
Research papers
Animal Behaviour publishes original papers relating to all aspects of the behaviour of animals, including humans. Papers may be field, laboratory or theoretical studies. Preference is given to studies that are likely to be of interest to the broad readership of the Journal and that test explicit hypotheses rather than being purely descriptive.

Reviews
These should address fundamental issues relating to behaviour and provide new insights into the subject(s) they cover. Original interdisciplinary syntheses are especially welcome. Reviews should be no longer than 6000 words (excluding references) and should include an abstract of up to 300 words. In the first instance, a preliminary outline of up to 600 words should be submitted online (see Contact details for submission below). The decision as to whether to proceed to a full review then rests with the Executive Editors or invited advisers. Contributions submitted on this basis will be subjected to the same refereeing process as normal manuscripts.

Commentaries
The Commentaries section of the Journal provides an opportunity to raise issues of general importance to the study of behaviour, including statistical analysis, theory, methodology and ethics. Unless there are clearly broader implications for the study of behaviour as a whole, critiques of particular papers or issues of more local interest should be reserved for the Forum section (see below). Decisions as to whether borderline submissions are more appropriate to the Commentaries or Forum section rest with the Executive Editors. Contributions should be brief, normally not more than six printed pages, and should not contain an abstract. Methodological contributions may be longer, and may contain an abstract, subject to the discretion of the Executive Editors. Contributions with prima facie merit are subjected to the same refereeing process as normal manuscripts, but responses or complementary articles may be solicited by the Executive Editors at their discretion. Other contributions are returned unrefereed to the author(s).

Forum
The Forum section is published on ScienceDirect with contributions listed in the contents of the relevant hardcopy issue and cited as indicated in References below. The section accepts critiques of published papers relevant to the areas of interest of the Journal, and provides an opportunity for constructive exchanges on issues surrounding particular fields of study. Submission, review and acceptance procedures are as for Commentaries (see above), but there is no word limit. In the case of Forum critiques of published papers, the author(s) of the target article must be contacted and trivial points of difference or misunderstanding resolved; this correspondence must be submitted in a cover letter accompanying the Forum article with the knowledge of the author(s) of the target article.

More general correspondence on matters relating to behavioural research is published, unrefereed, in the newsletters of ASAB and ABS. Such correspondence should be sent to the newsletter editors: Dr H. M. Rowland, Department of Zoology, University of Cambridge, Downing Street, Cambridge CB2 3EJ, UK (e-mail: asabnewslettereditor@gmail.com) for ASAB; Susan M. Bertram, Department of Biology, Carleton University, 1125 Colonel By Drive, Ottawa, ON K1S 5B6, Canada (e-mail: Sue_Bertram@carleton.ca) for ABS.

Single and double blind peer review
Animal Behaviour has instituted a double blind peer review process (i.e., where neither the authors' nor the reviewers' identities are known to each other). Reciprocal anonymity is suggested to provide a more objective and potentially less biased assessment of manuscripts, and help ensure that the process is fair to both junior and well-established scientists. The switch to double blind review
requires some changes to editorial procedures, and we ask potential authors to pay close attention to our revised submission guidelines. Our policy with respect to reviewers is to allow them to waive anonymity if they wish, and in accord with this, authors may also choose to submit their papers without being blinded, giving both authors and reviewers maximum flexibility in how they wish their work and comments to be assessed. *Animal Behaviour* is one of the foremost journals in its field, and the implementation of double blind review aims at ensuring our reputation for integrity, fairness and openness to new ideas.

**Contact details for submission**

Authors should submit manuscripts online to Elsevier's Editorial System (EES) [http://ees.elsevier.com/anbeh](http://ees.elsevier.com/anbeh). When submitting online, authors are requested to select the article type (Research paper, Review, Review Proposal, Commentary, Forum). Each category of article is further divided into US and UK articles (e.g. US Research paper, UK Research paper, etc.) depending on whether the US or UK Editorial Office is responsible for processing the manuscript. Authors whose current address is in the Americas, or neighbouring islands, or who are members of the Animal Behaviour Society should select the US article types and authors in other geographical areas or who are members of the Association for the Study of Animal Behaviour should select the UK article types. Hard copies are not required in addition to copies submitted online. Authors who are submitting a manuscript online for the first time should read the Author Tutorial on the submission site. For enquiries relating to submissions via EES, please contact the Journal Manager at Elsevier via e-mail (yanbe@elsevier.com).

For other general correspondence:

The address of the UK office is: Dr A.K. Turner, Managing Editor, Animal Behaviour Editorial Office, School of Life Sciences, University of Nottingham, University Park, Nottingham NG7 2RD, U.K. (e-mail: angela.turner@nottingham.ac.uk).

The address of the US office is: Kris Bruner, Managing Editor, Animal Behaviour Editorial Office, Indiana University, 407 N. Park Avenue, Bloomington, IN 47408, U.S.A. (e-mail: krbruner@indiana.edu).

Correspondence about book reviews handled through the North American office should be sent to: Dr P. Loesche, Department of Psychology, Box 351525, University of Washington, Seattle, WA 98195, U.S.A. (e-mail: loes@uw.edu).

**BEFORE YOU BEGIN**

**Ethics in publishing**

*Animal Behaviour* publishes papers by scientists conducting research at locations around the globe. Publication is, therefore, based upon mutual trust between publisher and authors. Professional integrity in the conduct and reporting of research is an absolute requirement of publication in the journal, as is a willingness to share information with other members of the scientific community. Consequently, as a condition of publication in *Animal Behaviour*, authors must agree both to honour any reasonable request for materials or methods needed to verify or replicate experiments reported in the journal and to make available, upon request, any data sets upon which published studies are based. Anyone who encounters a persistent refusal to comply with these guidelines, or has reason to suspect some other departure from acceptable standards of scientific conduct, should contact the appropriate Executive Editor (European or American) of the journal. The Executive Editors will act in accordance with the guidelines of the Committee for Publication Ethics [http://www.publicationethics.org](http://www.publicationethics.org) and may inform an author's institution of a purported infraction. Statements on scientific integrity by the Association for the Study of Animal Behaviour and the Animal Behavior Society can be found at, respectively, [http://www.asab.org](http://www.asab.org) and [http://animalbehaviorsociety.org](http://animalbehaviorsociety.org).

**Originality and plagiarism**

As noted in Elsevier's publishing and ethical guidelines, authors should ensure that they have written entirely original works. If authors have used the work, data, or words of others or their own earlier publications, please ensure that this has been appropriately cited or quoted. Please also declare such overlaps in the cover letter on submission. Plagiarism takes many forms, from ‘passing off’ another's paper as the author's own paper, to copying or paraphrasing substantial parts of another's paper or indeed one's own earlier paper (without attribution), to claiming results from research conducted by others. Plagiarism in all its forms constitutes unethical publishing behaviour and is unacceptable. All manuscripts are automatically put through a plagiarism check program and flagged results are evaluated individually.
For further information on Ethics in Publishing and Ethical guidelines for journal publication, see also http://www.elsevier.com/publishingethics and http://www.elsevier.com/ethicalguidelines.

**Animal welfare**

Animal Welfare

The research should adhere to the ASAB/ABS Guidelines for the Use of Animals in Research (updated in each January issue of the Journal: https://doi.org/10.1016/j.anbehav.2017.10.001), the legal requirements of the country in which the work was carried out, and all institutional guidelines. The Guide to Ethical Information Required for Animal Behaviour Papers (http://www.elsevier.com/__data/promis_misc/ethyanbe.doc) should be consulted and its requirements met. ASAB and ABS endorse the PREPARE guidelines for planning experiments (https://norecopa.no/prepare) and the ARRIVE guidelines for reporting experiments (http://www.nc3rs.org.uk/downloaddoc.asp?id=1206&page=1357&skin=0) using live animals. *Animal Behaviour* has exceptionally high standards for animal care for both vertebrates and invertebrates. In addition to the usual requests for permit and agency approval numbers, we would frequently like more information to address concerns that the animals were treated as well as possible given the constraints of the experimental design. See Ethical Note

**Declaration of interest**

All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential competing interests include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double-blind) or the manuscript file (if single-blind). If there are no interests to declare then please state this: 'Declarations of interest: none'. This summary statement will be ultimately published if the article is accepted. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal's official records. It is important for potential interests to be declared in both places and that the information matches. More information.

* *Animal Behaviour* will not consider submissions that have been published elsewhere, nor will it republish data found in other publications, unless the data are re-evaluated to provide new information not found in the original. Abstracts that both appear in published conference proceedings with ISBNs or ISSN, such as special editions of journals, and provide explicit quantitative summaries of the key results, are considered as prior publication. Overlap between submitted manuscripts and published abstracts containing qualitative descriptions of the manuscript will be allowed, provided that such abstracts are not verbatim reproductions of the abstract contained within the submitted manuscript. Include details of all abstracts and other published materials in a cover letter accompanying the submitted manuscript on EES, and provide copies of relevant published material as 'Related Material' on EES.

**Submission declaration and verification**

Submission of an article implies that the work described has not been published previously (except in the form of an abstract (See Conflict of Interest) or as part of a published lecture or academic thesis or as an electronic preprint, see https://www.elsevier.com/sharingpolicy), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service CrossCheck https://www.elsevier.com/editors/plagdetect.

**Use of inclusive language**

Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Articles should make no assumptions about the beliefs or commitments of any reader, should contain nothing which might imply that one individual is superior to another on the grounds of race, sex, culture or any other characteristic, and should use inclusive language throughout. Authors should ensure that writing is free from bias, for instance by using 'he or she', 'his/her' instead of 'he' or 'his', and by making use of job titles that are free of stereotyping (e.g. 'chairperson' instead of 'chairman' and 'flight attendant' instead of 'stewardess').
Changes to authorship
Authors are expected to consider carefully the list and order of authors before submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only before the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the corresponding author: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed.

Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors after the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

Article transfer service
This journal is part of our Article Transfer Service. This means that if the Editor feels your article is more suitable in one of our other participating journals, then you may be asked to consider transferring the article to one of those. If you agree, your article will be transferred automatically on your behalf with no need to reformat. Please note that your article will be reviewed again by the new journal. More information.

Copyright
Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see more information on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for use by authors in these cases.

For gold open access articles: Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' (more information). Permitted third party reuse of gold open access articles is determined by the author's choice of user license.

Author rights
As an author you (or your employer or institution) have certain rights to reuse your work. More information.

Elsevier supports responsible sharing
Find out how you can share your research published in Elsevier journals.

Role of the funding source
You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article in the Acknowledgments section of the manuscript.

Funding body agreements and policies
Elsevier has established a number of agreements with funding bodies which allow authors to comply with their funder's open access policies. Some funding bodies will reimburse the author for the gold open access publication fee. Details of existing agreements are available online.

Open access
This journal offers authors a choice in publishing their research:

Subscription
- Articles are made available to subscribers as well as developing countries and patient groups through our universal access programs.
- No open access publication fee payable by authors.
• The Author is entitled to post the accepted manuscript in their institution's repository and make this public after an embargo period (known as green Open Access). The published journal article cannot be shared publicly, for example on ResearchGate or Academia.edu, to ensure the sustainability of peer-reviewed research in journal publications. The embargo period for this journal can be found below.

**Gold open access**

• Articles are freely available to both subscribers and the wider public with permitted reuse.
• A gold open access publication fee is payable by authors or on their behalf, e.g. by their research funder or institution.

Regardless of how you choose to publish your article, the journal will apply the same peer review criteria and acceptance standards.

For gold open access articles, permitted third party (re)use is defined by the following Creative Commons user licenses:

*Creative Commons Attribution (CC BY)*

Lets others distribute and copy the article, create extracts, abstracts, and other revised versions, adaptations or derivative works of or from an article (such as a translation), include in a collective work (such as an anthology), text or data mine the article, even for commercial purposes, as long as they credit the author(s), do not represent the author as endorsing their adaptation of the article, and do not modify the article in such a way as to damage the author's honor or reputation.

*Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)*

For non-commercial purposes, lets others distribute and copy the article, and to include in a collective work (such as an anthology), as long as they credit the author(s) and provided they do not alter or modify the article.

The gold open access publication fee for this journal is **USD 2600**, excluding taxes. Learn more about Elsevier's pricing policy: [https://www.elsevier.com/openaccesspricing](https://www.elsevier.com/openaccesspricing).

*Green open access*

Authors can share their research in a variety of different ways and Elsevier has a number of green open access options available. We recommend authors see our green open access page for further information. Authors can also self-archive their manuscripts immediately and enable public access from their institution's repository after an embargo period. This is the version that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and in editor-author communications. Embargo period: For subscription articles, an appropriate amount of time is needed for journals to deliver value to subscribing customers before an article becomes freely available to the public. This is the embargo period and it begins from the date the article is formally published online in its final and fully citable form. Find out more.

This journal has an embargo period of 24 months.

*Language and language services*

*Write manuscripts in British English and preferably in the active voice.* Authors who are unsure of correct English usage should have their manuscript checked by someone proficient in the language. Manuscripts in which the English is difficult to understand may be returned to the author for revision before scientific review. Papers that are accepted but incorrectly prepared or whose English is poor, may also be subject to delays in the press. After acceptance, the Editorial Offices will edit papers in accordance with the house style and will help authors to communicate effectively.

Authors who require information about language editing and copyediting services pre- and post-submission please visit [http://www.elsevier.com/languagepolishing](http://www.elsevier.com/languagepolishing) or our customer support site at [service.elsevier.com](http://service.elsevier.com) for more information. Please note Elsevier neither endorses nor takes responsibility for any products, goods or services offered by outside vendors through our services or in any advertising. For more information please refer to our Terms & Conditions: [http://www.elsevier.com/termsandconditions](http://www.elsevier.com/termsandconditions)

Our online submission system guides you stepwise through the process of entering your article details and uploading your files. The system converts your article files to a single PDF file used in the peer-review process. Editable **Word** files are required to typeset your article for final publication. All correspondence, including notification of the Editor's decision and requests for revision, is sent by e-mail.
Before submitting online, make sure you have the following details: all authors’ names and addresses and their permission to proceed with submission, the details of any licences/permits/institutional approval you had for the study, suggestions for referees and any opposed referees. You will need to upload a cover letter, title page, animal welfare note (including details of any licences/permits/institutional approval, etc.; see Animal welfare and Ethical Note), acknowledgments and manuscript.

Submit your article
Please submit your article via http://ees.elsevier.com/anbeh.

Referees
Please submit, with the manuscript, the names and e-mail addresses of 4 potential referees.
In case of double blind peer review, please make sure that all text that may reveal your identity is excluded from the source files.

PREPARATION

NEW SUBMISSIONS
Submission to this journal proceeds totally online and you will be guided stepwise through the creation and uploading of your files. The system automatically converts your files to a single PDF file, which is used in the peer-review process.
As part of the Your Paper Your Way service, you may choose to submit your manuscript as a single file to be used in the refereeing process. This can be a PDF file or a Word document, in any format or layout that can be used by referees to evaluate your manuscript. It should contain high enough quality figures for refereeing. If you prefer to do so, you may still provide all or some of the source files at the initial submission. Please note that individual figure files larger than 10 MB must be uploaded separately.

Your Paper Your Way
There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. However, please don’t use numbers for the references in the text and list them alphabetically in the Reference section. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct.

Formatting requirements
There are no strict formatting requirements but all manuscripts must contain the essential elements needed to convey your manuscript, for example Title page, Abstract, Keywords, Introduction, Methods, Results, Discussion, References, Tables, Figure Legends, Figures, and bulleted Highlights summarizing your article. If your article includes any Videos and/or other Supplementary material, this should be included in your initial submission for peer review purposes. Divide the article into clearly defined sections.

Line numbering and double spacing text
Please ensure the text of your paper is double-spaced and has consecutive line numbering – this is an essential peer review requirement.

Figures and tables embedded in text
Please ensure the figures and the tables included in the single file are placed next to the relevant text in the manuscript, rather than at the bottom or the top of the file. The corresponding caption should be placed directly below the figure or table.

Peer review
This journal operates a double blind review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of two independent expert reviewers to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor’s decision is final. More information on types of peer review.

Double-blind review
This journal uses double-blind review, which means the identities of the authors are concealed from the reviewers, and vice versa. More information is available on our website. To facilitate this, please include the following separately:
Title page (with author details): This should include the title, authors' names, affiliations, acknowledgements and any Declaration of Interest statement, and a complete address for the corresponding author including an e-mail address.

Blinded manuscript (no author details): The main body of the paper (including the references, figures, tables and any acknowledgements) should not include any identifying information, such as the authors' names or affiliations.

REVISED SUBMISSIONS

Language
Please write your text in good English (British usage only is accepted). Use decimal points (not decimal commas); use a space for thousands (10 000 and above).

Use of word processing software
Regardless of the file format of the original submission, at revision you must provide us with an editable file of the entire article. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier). See also the section on Electronic artwork.
To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

Article structure

Subdivision - unnumbered sections
Divide your article into clearly defined sections. Each subsection is given a brief heading. Each heading should appear on its own separate line. Subsections should be used as much as possible when cross-referencing text: refer to the subsection by heading as opposed to simply "the text".
The usual main headings for Research papers are: Methods, Results, Discussion, Acknowledgments and References (no heading is used for the Abstract or Introduction). Papers should not be forced to fit into this pattern of headings, however, if they do not naturally do so. Type main headings in capitals on a separate line on the left of the page. Type subheadings in italics at the left of the page on a separate line, and begin the main words with a capital letter. Type sub-subheadings in italics on a new line, aligned full left. Start the text on a new line after subheadings and sub-subheadings. When presenting multiple experiments, authors may use main headings for the titles of each experiment, with the Methods and Results of each experiment listed as subheadings. Try to keep subheadings short enough to fit within a single column.

Introduction
State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.
The Introduction should be brief, not normally exceeding two manuscript pages. Keep references to a minimum by citing reviews rather than primary research papers where appropriate.

Methods
Provide sufficient detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should be described.
Give the names and addresses of companies providing trademarked products. Always state sample sizes (the number of animals used in the study) and the age, sex, breed/strain and source of animals. Full details of testing or observational regimes should be given. If captive animals were used, include details of housing conditions relevant to the study (e.g. cage size and type, bedding, group size and composition, lighting, temperature, ambient noise conditions, maintenance diets) both during the study and during any period before the study that might bear on the results. The Methods section may also contain a description of the kinds of statistics used and the activities that were recorded.

Ethical Note
Ethical note. Where ethical considerations arise from the study, these should be addressed in the Methods, either in the main Methods section itself (where the additional discussion is relatively minor), or in a separate subsection of the Methods headed Ethical note. This information (i.e. an Ethical Note or a summary of details given in the text) should also be uploaded separately as an 'Animal welfare note' (see Animal welfare). Any welfare or environmental implications of the experimental design and procedures should be identified, and any licences acquired to carry out the work specified. Procedures that were taken to minimize the welfare impact on subjects, including choice of sample sizes, use of pilot tests and predetermined rules for intervention, should be described. Any steps taken to enhance
the welfare of subjects (e.g. through 'environmental enrichment') should also be indicated. If the study involved keeping wild animals in captivity, state for how long the animals were captive and whether, where and how they were returned to the wild at the end of the study.

Results

Results should be clear and concise. This section should include only results that are relevant to the hypotheses outlined in the Introduction and considered in the Discussion. The text should complement material given in Tables or Figures but should not directly repeat it. Give full details of statistical analysis either in the text or in Tables or Figure legends. Include the type of test, the precise data to which it was applied, the value of the relevant statistic, the sample size and/or degrees of freedom, and the probability level. Number Tables and Figures in the order to which they are referred in the text. Means and standard errors/standard deviations (and medians and interquartile ranges/confidence limits), with their associated sample sizes, are given in the format $X + SE = 10.20 + 1.01 g$, $N = 15$, not $X = 10.20$, SE = 1.01, $N = 15$.

For significance tests, give the name of the test followed by a colon, the test statistic and its value, the degrees of freedom or sample size (whichever is the convention for the test) and the $P$ value (note that $F$ values have two degrees of freedom). The different parts of the statistical quotation are separated by a comma. Note use of italics for $F$, $P$, $N$ and other variables.

If the test statistic is conventionally quoted with degrees of freedom, these are presented as a subscript to the test statistic. For example:

ANOVA: $F_{1,11} = 7.89$, $P = 0.017$
Kruskal-Wallis test: $H_{11} = 287.8$, $P = 0.001$
Chi-square test: $X^2_{1} = 0.19$, $P = 0.91$
Paired $t$ test: $t_{12} = 1.99$, $P = 0.07$

If the test is conventionally quoted with the sample size, this should follow the test statistic value. For example:

Spearman rank correlation: $r_s = 0.80$, $N = 11$, $P < 0.01$
Wilcoxon signed-ranks test: $T = 6$, $N = 14$, $P < 0.01$
Mann-Whitney $U$ test: $U = 74$, $N_1 = N_2 = 17$, $P < 0.02$

$P$ values for significant outcomes can be quoted as below a threshold significance value (e.g. $P < 0.05$, 0.01, 0.001), but wherever possible should be quoted as an exact probability value. Departure from a significance threshold of 0.05 should be stated and justified in the Methods. Marginally nonsignificant outcomes can be indicated as exact probability values or as $P < 0.1$. Nonsignificant outcomes should be indicated with an exact probability value whenever possible, or as NS or $P > 0.05$, as appropriate for the test.

State whether a test is one tailed or two tailed (or specific or nonspecific in the case of Meddis' nonparametric ANOVAs). One-tailed (or specific) tests should be used with caution. Their use is justified only when there are strong a priori reasons for predicting the direction of a difference or trend and results in the opposite direction can reasonably be regarded as equivalent to no difference or trend at all. Authors are referred to Kimmel (1957, Psychological Bulletin, 54, 315-353).

Do not quote decimals with naked points, for example quote 0.01, not .01, or normally to more than three decimal places (the exception being $P$ values for significance tests, which may be quoted to four decimal places where appropriate, e.g. 0.0001).

Regressions and analyses of variance. The significance of regressions should be tested with $F$ or $t$ but not the correlation coefficient $r$. $R^2$ should be quoted with both regressions and parametric analyses of variance.

Multiple range tests. Unplanned multiple range tests following ANOVA should be avoided unless their appropriateness for the comparisons in question is verified explicitly. Authors are referred to the review by Day and Quinn (1989, Ecological Monographs, 59, 433-463).
**Power tests.** Where a significance test based on a small sample size yields a nonsignificant result, explicit consideration should be given to the power of the data for accepting the null hypothesis. Authors are referred to Thomas and Juanes (1996, *Animal Behaviour, 52*, 856-859) and Colegrave and Ruxton (2003, *Behavioral Ecology, 14*, 446-447) for guidance on the appropriate use of power tests. Providing a value for power based on a priori tests is preferred. Values of observed power are not appropriate. Authors should consider effect sizes and their confidence intervals in drawing conclusions regarding the null hypothesis.

**Transformations.** Where data have been transformed for parametric significance tests, the nature of the transformation and the reason for its selection (e.g. log \( x \), \( x^2 \), arcsine) should be stated.

**Discussion**
It is often helpful to begin the Discussion with a summary of the main results. The main purpose of the Discussion, however, is to comment on the significance of the results and set them in the context of previous work. The Discussion should be concise and not excessively speculative, and references should be kept to a minimum by citing review articles as much as possible.

**Conclusions**
The main conclusions of the study may be presented in a short Conclusions section, as a subsection of a Discussion or Results and Discussion section.

**Appendices**
If there is more than one appendix, they should be identified as 1, 2, etc. Formulae and equations in appendices should be given separate numbering: equation (A1), equation (A2), etc.

**Essential title page information**

**Title.** This should be brief and informative, and should not exceed 120 characters. Avoid abbreviations, as well as part numbers unless the papers are to be published consecutively in the same issue of the Journal.

**Author names and affiliations.** Where the family name may be ambiguous (e.g. a double name), please indicate this clearly. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Affiliations should not include street, box number, postal (zip) code, country (when that is obvious) or city, state, province, etc., when that is redundant with the University name.

**Corresponding author.** Clearly indicate who is willing to handle correspondence at all stages of refereeing and publication, also post-publication. Ensure that telephone (with country and area code) is provided in addition to the e-mail address and the complete postal address.

**Correspondence.** At the bottom of the page, give the full postal address and e-mail address (if desired) of the corresponding author and the present addresses of any co-authors if different from their affiliations; e-mail addresses of co-authors may also be given.

**Word count.** Include a word count for the text.

**Title document**
The title document should contain the title of the article, all affiliations of the corresponding author and co-authors and the corresponding author's address. In case of double blind peer review, this information should not appear in any other file, in order not to yield the authors identity to the reviewer.

**Abstract**
The Abstract should describe the purpose of the study, outline the major findings and state the main conclusions. It should be concise, informative, explicit and intelligible without reference to the text. Abstracts should usually be limited to 300 words. Use both common and scientific names of animals at first mention in the Abstract unless they are given in the title. Avoid using references; if used, give the journal name, volume and page numbers, or the book title and publisher.
**Highlights**  
Highlights are mandatory for this journal for research articles, reviews, commentaries and forum articles. They consist of a short collection of bullet points that convey the core findings of the article and should be submitted in a separate file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters including spaces and each bullet point should be on a separate line). See [http://www.elsevier.com/highlights](http://www.elsevier.com/highlights) for examples.

**Keywords**  
Immediately after the abstract, provide up to 10 keywords, using British spelling and avoiding general and plural terms and multiple concepts (avoid, for example, "and", "of"). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible.

**Abbreviations**  
Define abbreviations that are not standard in this field at their first mention in the abstract and the main text. Ensure consistency of abbreviations throughout the article.

**Acknowledgements**  
Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

**Nomenclature and units**  
Follow internationally accepted rules and conventions: use the international system of units (SI). If other quantities are mentioned, give their equivalent in SI.

**Math formulae**  
Present simple formulae in the line of normal text where possible. Single-letter variables should be italics. Number consecutively any equations that have to be displayed separately from the text.

**Numerals**  
Write numbers of 10 or more as numerals except at the beginning of a sentence. Write the numbers one to nine in words, unless they precede units of measure or are used as designators. Quote times of day using the 24-hour clock without a break or point in the middle and followed by 'hours'; e.g. '1515 hours'. Give years in full; e.g. '1986-1987'.

**Footnotes**  
Use footnotes only to add information below the body of a Table (using superscript letters or numbers), for probability values in Figures and Tables (using multiple asterisks) and, on the title page, for authors' affiliations (using an asterisk for the corresponding author and superscript letters for authors' affiliations). Superscript numbers may be used for coauthors' e-mail addresses and/or changes of address, and other information such as a deceased author.

**Artwork**  
**Image manipulation**  
While it is accepted that authors sometimes need to manipulate images for clarity, manipulation for purposes of deception or fraud will be seen as scientific ethical abuse and will be dealt with accordingly. For graphical images, this journal is applying the following policy: no specific feature within an image may be enhanced, obscured, moved, removed, or introduced. Adjustments of brightness, contrast, or colour balance are acceptable if and as long as they do not obscure or eliminate any information present in the original. Nonlinear adjustments (e.g. changes to gamma settings) must be disclosed in the figure legend.

**Electronic artwork**  
**General points**  
- Make sure you use uniform lettering and sizing of your original artwork.  
- Preferred fonts: Arial (or Helvetica), Times New Roman (or Times), Symbol, Courier.  
- Number the illustrations according to their sequence in the text.  
- Use a logical naming convention for your artwork files.  
- Indicate per figure if it is a single, 1.5 or 2-column fitting image.  
- For Word submissions only, you may still provide figures and their captions, and tables within a single file at the revision stage.  
- Please note that individual figure files larger than 10 MB must be provided in separate source files.  
A detailed guide on electronic artwork is available on our website: [http://www.elsevier.com/artworkinstructions](http://www.elsevier.com/artworkinstructions).
You are urged to visit this site; some excerpts from the detailed information are given here.

 Formats
Regardless of the application used, when your electronic artwork is finalized, please 'save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):
- EPS (or PDF): Vector drawings. Embed the font or save the text as 'graphics'.
- TIFF (or JPEG): Colour or greyscale photographs (halftones): always use a minimum of 300 dpi.
- TIFF (or JPEG): Bitmapped line drawings: use a minimum of 1000 dpi.
- TIFF (or JPEG): Combinations bitmapped line/half-tone (colour or greyscale): a minimum of 500 dpi is required.

Please do not:
- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); the resolution is too low.
- Supply files that are too low in resolution.
- Submit graphics that are disproportionately large for the content.

Colour artwork
If, together with your accepted article, you submit usable colour figures, then Elsevier will ensure, at no additional charge, that these figures will appear in colour on the Web (e.g., ScienceDirect and other sites). If colour is essential for interpretation, these figures will also appear in colour in the printed version, at no additional charge. For further information on the preparation of electronic artwork, please see http://www.elsevier.com/artworkinstructions.

Please note: because of technical complications that can arise by converting colour figures to "greyscale" (should you not opt for colour in print) please submit in addition usable black and white versions of all the colour illustrations.

Figure captions
Ensure that each illustration has a caption. A caption should comprise a brief title (not on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

Tables
Number tables consecutively, with Arabic numerals, in accordance with their appearance in the text. Place footnotes to tables below the table body and indicate them with superscript symbols. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article. Do not divide tables into two or more parts. Tables should not contain vertical rules, and the main body of the table should not contain horizontal rules. Large tables should be narrow (across the page) and long (down the page) rather than wide and short, so that they can be fitted into the column width of the Journal.

References

Citations in the text
Check that all references in the text are in the reference list and vice versa, that their dates and spellings match, and that complete bibliographical details are given, including page numbers, names of editors, name of publisher and full place of publication if the article is published in a book. References cited in the Abstract must be given in full. Unpublished results are not recommended in the reference list. If these references are included in the reference list, they should follow the standard reference style of the journal. Check foreign language references particularly carefully for accuracy of diacritical marks such as accents and umlauts. For papers in the course of publication, use 'in press' to replace the date and give the journal name in the references.

Web references
Because of the ephemeral nature of many Web sites, other Web citations will be reviewed by the Editors to ensure they are appropriate to an archival journal. As a minimum, the full URL should be given. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given.
Data references
This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

References in a special issue
Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

Reference management software
Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support Citation Style Language styles, such as Mendeley and Zotero, as well as EndNote. Using the word processor plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. More information on how to remove field codes.

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:
http://open.mendeley.com/use-citation-style/animal-behaviour

When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.

Reference formatting
There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the article number or pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct. If you do wish to format the references yourself they should be arranged according to the following examples:

Reference style
Text: Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 978-1-4338-0561-5, copies of which may be ordered online or APA Order Dept., P.O.B. 2710, Hyattsville, MD 20784, USA or APA, 3 Henrietta Street, London, WC3E 8LU, UK.

List: references should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication.

Examples:
Reference to a journal publication:

Reference to a journal publication with an article number:

Reference to a book:

Reference to a chapter in an edited book:

Reference to a website:

Reference to a dataset:
Reference to a conference paper or poster presentation:

Reference to a thesis:


Note that journal titles in the reference list should be written in full.

For publications in any Latin script language other than English, give the original title and, in brackets, the English translation. Titles of publications in non-Latin scripts should be transliterated. Work accepted for publication but not yet published should be referred to as "in press".
Cite "personal communications" in the text only. Provide the initials and surname(s) for personal communications and give the date of the personal communication (as exact as possible), separated by a comma (A. Smith, personal communication, 9 September 2013).

Video and Audio Data
Elsevier accepts video/audio material and animation sequences to support and enhance your scientific research. Authors who have video, audio or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video, audio or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video/audio file's content. In order to ensure that your video or animation material is directly usable, please provide the files in one of our recommended file formats with a preferred maximum size of 50 MB. Video, audio and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including ScienceDirect: http://www.sciencedirect.com. Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video/audio data. For more detailed instructions please visit our video instruction pages at http://www.elsevier.com/artworkinstructions. Note: since video, audio and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

Data visualization
Include interactive data visualizations in your publication and let your readers interact and engage more closely with your research. Follow the instructions here to find out about available data visualization options and how to include them with your article.

Supplementary Material
Supplementary material, such as applications, images and sound clips, can be published with your article to enhance it. This material should be restricted to file types such as videos, audio files, very large tables or figures, etc. that do not fit the normal layout of the printed journal and/or that are truly supplementary (raw data files, R code or content that is not essential to the article). Other material such as additional methods and results, tables and figures that support the main text should be added as appendices after the references. Note that research data (including raw and processed data, video, code, software, algorithms, protocols and methods) associated with your manuscript can alternatively be deposited in a data repository (see Research Data below). Submitted supplementary items are published exactly as they are received (Excel or PowerPoint files will appear as such online). Please submit your material together with the article and supply a concise, descriptive caption for each supplementary file. If you wish to make changes to supplementary material during any stage of the process, please make sure to provide an updated file. Do not annotate any corrections on a
previous version. Please switch off the 'Track Changes' option in Microsoft Office files as these will appear in the published version. For guidance on submitting artwork and multimedia see http://www.elsevier.com/artworkinstructions.

**Research data**
This journal encourages and enables you to share data that supports your research publication where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate research findings. To facilitate reproducibility and data reuse, this journal also encourages you to share your software, code, models, algorithms, protocols, methods and other useful materials related to the project.

Below are a number of ways in which you can associate data with your article or make a statement about the availability of your data when submitting your manuscript. If you are sharing data in one of these ways, you are encouraged to cite the data in your manuscript and reference list. Please refer to the "References" section for more information about data citation. For more information on depositing, sharing and using research data and other relevant research materials, visit the research data page.

**Data linking**
If you have made your research data available in a data repository, you can link your article directly to the dataset. Elsevier collaborates with a number of repositories to link articles on ScienceDirect with relevant repositories, giving readers access to underlying data that gives them a better understanding of the research described.

There are different ways to link your datasets to your article. When available, you can directly link your dataset to your article by providing the relevant information in the submission system. For more information, visit the database linking page.

For supported data repositories a repository banner will automatically appear next to your published article on ScienceDirect.

In addition, you can link to relevant data or entities through identifiers within the text of your manuscript, using the following format: Database: xxxx (e.g., TAIR: AT1G01020; CCDC: 734053; PDB: 1XFN).

**Mendeley Data**
This journal supports Mendeley Data, enabling you to deposit any research data (including raw and processed data, video, code, software, algorithms, protocols, and methods) associated with your manuscript in a free-to-use, open access repository. During the submission process, after uploading your manuscript, you will have the opportunity to upload your relevant datasets directly to Mendeley Data. The datasets will be listed and directly accessible to readers next to your published article online.

For more information, visit the Mendeley Data for journals page.

**Data statement**
To foster transparency, we encourage you to state the availability of your data in your submission. This may be a requirement of your funding body or institution. If your data is unavailable to access or unsuitable to post, you will have the opportunity to indicate why during the submission process, for example by stating that the research data is confidential. The statement will appear with your published article on ScienceDirect. For more information, visit the Data Statement page.

**Submission checklist**
The following list will be useful during the final checking of an article prior to sending it to the journal for review. Please consult this Guide for Authors for further details of any item.

**Ensure that the following items are present:**
One author has been designated as the corresponding author with contact details:
- E-mail address
- Full postal address
- Telephone
All necessary files have been uploaded, and contain:
- Keywords
- All figure captions
- All tables (including title, description, footnotes)
Further considerations
• Manuscript has been 'spell-checked' and 'grammar-checked'
• Manuscript should have continuous line numbers and double spacing
• All references mentioned in the Reference list are cited in the text, and vice versa
• Permission has been obtained for use of copyrighted material from other sources (including the Web)
• Color figures are clearly marked as being intended for color reproduction on the Web (free of charge) and in print, or to be reproduced in color on the Web (free of charge) and in black-and-white in print
• If only color on the Web is required, black-and-white versions of the figures are also supplied for printing purposes

For any further information please visit our customer support site at http://service.elsevier.com.

AFTER ACCEPTANCE

Proofs
One set of page proofs in PDF format will be sent by e-mail to the corresponding author. Elsevier now sends PDF proofs which can be annotated; for this you will need to download Adobe Reader© version 7 (or higher) available free from http://www.adobe.com/products/acrobat/readstep2.html. Instructions on how to annotate PDF files will accompany the proofs. The exact system requirements are given at the Adobe site: http://www.adobe.com/products/reader/systemreqs. If you do not wish to use the PDF annotations function, you may list the corrections (including replies to the Query Form) in an e-mail. Please list your corrections quoting line number. If, for any reason, this is not possible, then mark the corrections and any other comments (including replies to the Query Form) on a printout of your proof and return by fax, or scan the pages and e-mail, or by post. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this stage with permission from the Editor. We will do everything possible to get your article published quickly and accurately. Therefore, it is important to ensure that all of your corrections are sent back to us in one communication: please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility. Note that Elsevier may proceed with the publication of your article if no response is received.

Author's discount
Contributors to Elsevier journals are entitled to a 30% discount on most Elsevier books, if ordered directly from Elsevier.

Offprints
The corresponding author will, at no cost, receive 25 free paper offprints, or alternatively a customized Share Link providing 50 days free access to the final published version of the article on ScienceDirect. The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. Both corresponding and co-authors may order offprints at any time via Elsevier’s Webshop. Corresponding authors who have published their article gold open access do not receive a Share Link as their final published version of the article is available open access on ScienceDirect and can be shared through the article DOI link.

AUTHOR INQUIRIES
Visit the Elsevier Support Center to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch.
You can also check the status of your submitted article or find out when your accepted article will be published.