DESCRIPTION

Published for more than 100 years, the *American Journal of Orthodontics and Dentofacial Orthopedics* remains the leading orthodontic resource. It is the official publication of the [American Association of Orthodontists](https://www.aaom.org), its constituent societies, the American Board of Orthodontics, and the College of Diplomates of the American Board of Orthodontics. Each month its readers have access to original peer-reviewed articles that examine all phases of orthodontic treatment. Illustrated throughout, the publication includes tables, color photographs, and statistical data. Coverage includes successful diagnostic procedures, imaging techniques, bracket and archwire materials, extraction and impaction concerns, orthognathic surgery, TMJ disorders, removable appliances, and adult therapy.

According to the 2017 Journal Citation Reports®, published by Thomson Reuters, *AJO-DO* is the highest ranked orthodontic title by number of citations. *AJO-DO* ranks 30th of 91 journals for total citations in the Dentistry, Oral Surgery and Medicine category, and has a five year impact factor of 2.201.

**Benefits to authors**

The *AJO-DO* provides many author benefits, such as free PDFs, a liberal copyright policy, special discounts on Elsevier publications, and much more. Please click here for more information on our author services.

Please see our Guide for Authors for information on article submission. If you require any further information or help, please visit our Support Center.

IMPACT FACTOR

2018: 1.911 © Clarivate Analytics Journal Citation Reports 2019

ABSTRACTING AND INDEXING

Scopus
PubMed/Medline
CINAHL
EDITORIAL BOARD

Editor- in-Chief
Rolf G. Behrents, DDS, MS, PhD, St. Louis, MO

Editor Emeritus
David L. Turpin, DDS, MSD, Seattle, WA
Wayne G. Watson, DDS, La Jolla, CA

Managing Editor
Chris Burke, Seattle, WA

Associate Editors

Biology
David Covell, Jr, DDS, MSD, PhD, Portland, OR

Dental Materials
Theodore Eliades, DDS MS, Dr Med Sci, PhD, FIMMM, FRSC, FInstP, Zurich, Switzerland

Evidence-Based Dentistry
Padhraig S. Fleming, MSc, PhD, MOOrth, RCS, FDS (Orth), FHEA, London, United Kingdom

Resident's Journal Review
Dan Grauer, DDS, MSD, PhD, Los Angeles, CA

Ethics in Orthodontics
Peter M. Greco, DMD, Philadelphia, PA

Case Reports
John Grubb, DDS, MSD, Escondido, CA

Imaging
Demetrios J. Halazonetis, DDS, MS, Kifissia, Greece

Litigation and Legislation
Laurance Jerrold, DDS, JD, Brooklyn, NY

Craniofacial Anomalies / Cleft Lip and Palate
Christos Katsaros, DDS, Dr med dent, Odont Dr/PhD, Bern, Switzerland

Clinician's Corner
Steven D. Marshall, MS, DDS, MS, Iowa City, IA

Continuing Education
Allen H. Moffitt, DMD, Murray, KY

Techno Bytes
J. Martin Palomo, DDS, MSD, Cleveland, OH

Statistics and Research Design
Nikolaos Pandis, DDS, MS, Dr med dent, MSc, PhD, Bern, Switzerland

TMD Function
John W. Stockstill, DDS, MS, Atlanta, GA

Biology
Zongyang Sun, DDS, MS, MSD, PhD, Columbus, OH

Growth and Development
Leslie A. Will, DMD, MSD, Boston, MA

American Board of Orthodontics
Chun-Hsi Chung, DMD, MS, Philadelphia, PA

Staff:
Jane Ryley, Publisher, Elsevier Inc.
Amy Norwitz, Journal Manager, Elsevier Inc.
GUIDE FOR AUTHORS

General Information
The *American Journal of Orthodontics and Dentofacial Orthopedics* publishes original research, reviews, case reports, clinical material, and other material related to orthodontics and dentofacial orthopedics.

Submitted manuscripts must be original, written in English, and not published or under consideration elsewhere. Manuscripts will be reviewed by the editor and consultants and are subject to editorial revision. Authors should follow the guidelines below.

Statements and opinions expressed in the articles and communications herein are those of the author(s) and not necessarily those of the editor(s) or publisher, and the editor(s) and publisher disclaim any responsibility or liability for such material. Neither the editor(s) nor the publisher guarantees, warrants, or endorses any product or service advertised in this publication; neither do they guarantee any claim made by the manufacturer of any product or service. Each reader must determine whether to act on the information in this publication, and neither the Journal nor its sponsoring organizations shall be liable for any injury due to the publication of erroneous information.

Electronic manuscript submission and review
The *American Journal of Orthodontics and Dentofacial Orthopedics* uses the *Elsevier Editorial System* (EES), an online manuscript submission and review system.

To submit or review an article, please go to the AJO-DO EES website: [http://ees.elsevier.com/ajodo](http://ees.elsevier.com/ajodo).

Rolf G. Behrents, Editor-in-Chief
E-mail: behrents@gmail.com

Send other correspondence to:
Chris Burke, Managing Editor
American Journal of Orthodontics and Dentofacial Orthopedics
University of Washington
Department of Orthodontics, D-569
HSC Box 357446
Seattle, WA 98195-7446
Telephone (206) 221-5413
E-mail:ckburke@aol.com

BEFORE YOU BEGIN

Ethics in publishing
Please see our information pages on Ethics in publishing and Ethical guidelines for journal publication.

Studies in humans and animals
If the work involves the use of human subjects, the author should ensure that the work described has been carried out in accordance with *The Code of Ethics of the World Medical Association* (Declaration of Helsinki) for experiments involving humans. The manuscript should be in line with the *Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals* and aim for the inclusion of representative human populations (sex, age and ethnicity) as per those recommendations. The terms *sex* and *gender* should be used correctly.

Authors should include a statement in the manuscript that informed consent was obtained for experimentation with human subjects. The privacy rights of human subjects must always be observed.

All animal experiments should comply with the *ARRIVE guidelines* and should be carried out in accordance with the U.K. Animals (Scientific Procedures) Act, 1986 and associated guidelines, *EU Directive 2010/63/EU for animal experiments*, or the National Institutes of Health guide for the care and use of Laboratory animals (NIH Publications No. 8023, revised 1978) and the authors should clearly indicate in the manuscript that such guidelines have been followed. The sex of animals must be indicated, and where appropriate, the influence (or association) of sex on the results of the study.
**Conflict of interest**

**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, a published lecture or academic thesis, see 'Multiple, redundant or concurrent publication' for more information), 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 Crossref Similarity Check.

**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').

**Contributors**
Each author is required to declare his or her individual contribution to the article: all authors must have materially participated in the research and/or article preparation, so roles for all authors should be described. The statement that all authors have approved the final article should be true and included in the disclosure.

**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.

**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 and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

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
The American Journal of Orthodontics and Dentofacial Orthopedics offers authors a choice in publishing their research:

Traditional Access
Articles are available at no additional cost to subscribers through individual or library subscriptions. Users in some developing countries and patient groups can access articles through our universal access programs. Other users can access articles on a pay-per-view basis. No publication fees are charged for traditional publication.

Open access
Open access articles are available to subscribers and nonsubscribers, and to the wider public with permitted reuse. For open access articles, permitted third party (re)use is defined by the following Creative Commons user licenses. The open access publication fee for this journal is $3000, excluding taxes. Learn more about Elsevier's pricing policy: 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. Regardless of how you choose to publish your article, the journal will apply the same peer review criteria and acceptance standards.

Green open access 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 12 months.

Language (usage and editing services)
Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the English Language Editing service available from Elsevier's WebShop.

Informed consent and patient details
Studies on patients or volunteers require ethics committee approval and informed consent, which should be documented in the paper. Appropriate consents, permissions and releases must be obtained where an author wishes to include case details or other personal information or images of patients and any other individuals in an Elsevier publication. Written consents must be retained by the author.
but copies should not be provided to the journal. Only if specifically requested by the journal in exceptional circumstances (for example if a legal issue arises) the author must provide copies of the consents or evidence that such consents have been obtained. For more information, please review the Elsevier Policy on the Use of Images or Personal Information of Patients or other Individuals. Unless you have written permission from the patient (or, where applicable, the next of kin), the personal details of any patient included in any part of the article and in any supplementary materials (including all illustrations and videos) must be removed before submission.

**Submission**

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 files (e.g., Word, LaTeX) 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.

**Blinding**

The *AJO-DO* uses a blind review process; the identity of the author and the location of the research are concealed from the reviewers, and the identities of the reviewers are concealed from the author. The following submission items are sent to reviewers during the review process and should not contain any identifying information.

- Manuscript
- Figures
- Tables
- Other Material

The title page, which should contain complete author information, is not sent to reviewers. In the manuscript, please pay special attention to Material and Methods and Acknowledgments sections; wherever author is mentioned, use the "hidden" format in Word to conceal it, or move it to the title page.

**Guidelines for Original Articles**


Before you begin, please review the guidelines below. To view a 7-minute video explaining how to prepare your article for submission, go to Video on Manuscript Preparation.

1. **Title Page.** Put all information pertaining to the authors in a separate document. Include the title of the article, full name(s) of the author(s), academic degrees, and institutional affiliations and positions; identify the corresponding author and include an address, telephone and fax numbers, and an e-mail address. This information will not be available to the reviewers.

2. **Abstract.** Structured abstracts of 250 words or less are preferred. A structured abstract contains the following sections: Introduction, describing the problem; Methods, describing how the study was performed; Results, describing the primary results; and Conclusions, reporting what the authors conclude from the findings and any clinical implications.

3. **Manuscript.** The manuscript proper should be organized in the following sections: Introduction and literature review, Material and Methods, Results, Discussion, Conclusions, References, and figure captions. Express measurements in metric units, whenever practical. Refer to teeth by their full name or their FDI tooth number. For style questions, refer to the *AMA Manual of Style, 10th edition*. Cite references selectively, and number them in the order cited. Make sure that all references have been mentioned in the text. Follow the format for references in "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (Ann Intern Med 1997;126:36-47); [http://www.icmje.org](http://www.icmje.org). Include the list of references with the manuscript proper. Submit figures and tables separately (see below); do not embed figures in the word processing document.

4. **Figures.** Digital images should be in TIF or EPS format, CMYK or grayscale, at least 5 inches wide and at least 300 pixels per inch (118 pixels per cm). Do not embed images in a word processing program. If published, images could be reduced to 1 column width (about 3 inches), so authors should ensure that figures will remain legible at that scale. For best results, avoid screening, shading, and colored backgrounds; use the simplest patterns available to indicate differences in charts. If a figure has been previously published, the legend (included in the manuscript proper) must give full credit to the original source, and written permission from the original publisher must be included. Be sure you have mentioned each figure, in order, in the text.
5. **Tables.** Tables should be self-explanatory and should supplement, not duplicate, the text. Number them with Roman numerals, in the order they are mentioned in the text. Provide a brief title for each. If a table has been previously published, include a footnote in the table giving full credit to the original source and include written permission for its use from the copyright holder. Submit tables as text-based files (Word is preferred, Excel is accepted) and not as graphic elements. Do not use colors, shading, boldface, or italic in tables. Do not submit tables as parts A and B; divide into 2 separate tables. Do not "protect" tables by making them "read-only." The table title should be put above the table and not as a cell in the table. Similarly, table footnotes should be under the table, not table cells.

6. **Model release and permission forms.** Photographs of identifiable persons must be accompanied by a release signed by the person or both living parents or the guardian of minors. Illustrations or tables that have appeared in copyrighted material must be accompanied by written permission for their use from the copyright owner and original author, and the legend must properly credit the source. Permission also must be obtained to use modified tables or figures.

7. **Copyright release.** In accordance with the Copyright Act of 1976, which became effective February 1, 1978, all manuscripts must be accompanied by the following written statement, signed by all authors: "The undersigned author(s) transfers all copyright ownership of the manuscript [insert title of article here] to the American Association of Orthodontists in the event the work is published. The undersigned author(s) warrants that the article is original, does not infringe upon any copyright or other proprietary right of any third party, is not under consideration by another journal, has not been previously published, and includes any product that may derive from the published journal, whether print or electronic media. I (we) sign for and accept responsibility for releasing this material." Scan the printed copyright release and submit it via EES.

8. **Use the International Committee of Medical Journal Editors Form for the Disclosure of Conflict of Interest (ICMJE Conflict of Interest Form).** If the manuscript is accepted, the disclosed information will be published with the article. The usual and customary listing of sources of support and institutional affiliations on the title page is proper and does not imply a conflict of interest. Guest editorials, Letters, and Review articles may be rejected if a conflict of interest exists.

9. **Institutional Review Board approval.** For those articles that report on the results of experiments of treatments where patients or animals have been used as the sample, Institutional Review Board (IRB) approval is mandatory. No experimental studies will be sent out for review without an IRB approval accompanying the manuscript submission.

**Guidelines for Systematic Reviews**

Systematic Reviews and Meta-Analyses must be prepared according to contemporary PRISMA (Preferred Reporting for Systematic Reviews and Meta-Analyses) standards. The AJO-DO will screen submissions for compliance before beginning the review process. To help authors understand and apply the standards, we have prepared a separate Guidelines for AJO-DO Systematic Reviews and Meta-Analyses. This guide includes links to a Model Orthodontic Systematic Review and an accompanying Explanation and Elaboration document. These guidelines are supplemental to the Guidelines for Original Articles, which describe how to meet general submission requirements, such as figure formats, reference style, required releases, and blinding.

**Systematic Review and Meta-Analysis Guide for Authors**

You can access a link to an annotated example of a Model Orthodontic Systematic Review. Further explanation of reporting practices is given in the accompanying Explanation and Elaboration document. These documents have been prepared in accordance with PRISMA guidelines and the "PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies that Evaluate Health Care Interventions: Explanations and Elaboration" (http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.1000100).

However, we have made these guidelines more relevant to orthodontics and have adapted the reporting template to encourage transparent and pertinent reporting by introducing subheadings corresponding to established PRISMA items.

Further information on reporting of systematic reviews can also be obtained in the Cochrane Handbook for Systematic Reviews of Interventions (http://www.cochrane-handbook.org).
**Guidelines for Randomized Clinical Trials**
Randomized Clinical Trials must meet current CONSORT (Consolidated Standards of Reporting Trials) requirements. The AJO-DO will screen submissions for compliance before beginning the review process. To help authors understand and apply the standards, we have prepared a separate document, Guidelines for AJO-DO Submissions: Randomized Clinical Trials. This document contains links to an Annotated RCT Sample Article and The CONSORT Statement: Application within and adaptations for orthodontic trials.

These guidelines are supplemental to the Guidelines for Original Articles, which describe how to meet general submission requirements, such as figure formats, reference style, required releases, and blinding.

**Guidelines for Miscellaneous Submissions**
Letters to the Editor and their responses appear in the Readers' Forum section and are encouraged to stimulate healthy discourse between authors and our readers. Letters to the Editor must refer to an article that was published within the previous six (6) months and must be less than 500 words including references. Submit Letters via the EES Web site. Submit a signed copyright release with the letter.

Brief, substantiated commentary on subjects of interest to the orthodontic profession is published occasionally as a Special Article. Submit Guest Editorials and Special Articles via the Web site.

Books and monographs (domestic and foreign) will be reviewed, depending upon their interest and value to subscribers. Send books to Chris Burke, Department of Orthodontics, University of Washington D-569, HSC Box 357446, Seattle, WA98195-7446. They will not be returned.

**Checklist for Authors**
- Title page, including full name, academic degrees, and institutional affiliation and position of each author; brief description of each author's contribution to the submission; and author to whom correspondence and reprint requests are to be sent, including address, business and home phone numbers, fax numbers, and e-mail address
- Highlights (up to 5 Highlights, written in complete sentences, 85 characters each)
- Abstract (structured, 250 words; a graphical abstract is optional)
- Manuscript, including references and figure legends
- Figures, in TIF or EPS format
- Tables
- Copyright release statement, signed by all authors
- Photographic consent statement(s)
- ICMJE Conflict of interest statement for each author
- Permissions to reproduce previously published material
- Permission to reproduce proprietary images (including screenshots that include a company logo)

**PREPARATION**

**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.

Article structure

Introduction
Provide an adequate background so readers can understand the nature of the problem and its significance. State the objectives of the work. Cite literature selectively, avoiding a detailed literature survey or a summary of the results.

Material and Methods
Provide sufficient detail to allow the work to be reproduced. If methods have already been published, indicate by a reference citation and describe only the relevant modifications. Include manufacturer information (company name and location) for any commercial product mentioned. Report your power analysis and ethics approval, as appropriate.

Results
Results should be clear and concise.

Discussion
Explain your findings and explore their significance. Compare and contrast your results with other relevant studies. Mention the limitations of your study, and discuss the implications of the findings for future research and for clinical practice. Do not repeat information given in other parts of the manuscript.

Conclusions
Write a short Conclusions section that can stand alone. If possible, refer back to the goals or objectives of the research.

Essential title page information

- **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
- **Author names and affiliations.** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lowercase superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
- **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. This responsibility includes answering any future queries about Methodology and Materials. Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.
- **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Highlights
Highlights are a short collection of bullet points that convey the core findings of the article. Highlights are optional and should be submitted in a separate editable 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, per bullet point). You can view example Highlights on our information site.

Abstract
A structured abstract using the headings Introduction, Methods, Results, and Conclusions is required for Original Article, Systematic Review, Randomized Controlled Trial, and Techno Bytes. An unstructured abstract is acceptable for Case Report and Clinician's Corner.

Graphical abstract
Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum
of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view Example Graphical Abstracts on our information site. Authors can make use of Elsevier’s Illustration Services to ensure the best presentation of their images and in accordance with all technical requirements.

**Acknowledgments**

Collate acknowledgments in a separate section at the end of the article before the references; do not include them on the title page, as a footnote to the title page, or otherwise. List here those individuals who provided help during the research (e.g., providing help with language or writing assistance, or proofreading the article).

**Formatting of funding sources**

List funding sources in this standard way to facilitate compliance to funder’s requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

**Artwork**

**Image manipulation**

Whilst 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 color 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.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the published version.
- Submit each illustration as a separate file.

A detailed guide on electronic artwork is available. **You are urged to visit this site; some excerpts from the detailed information are given here.**

**Formats**

If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format. Regardless of the application used other than Microsoft Office, 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 all used fonts.

TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.

TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.

TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.
Please do not:
- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

Color artwork
Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF) or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) in addition to color reproduction in print. Further information on the preparation of electronic artwork.

Figure captions
Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. 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
Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

References
Citation in text
Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

Reference links
Increased discoverability of research and high quality peer review are ensured by online links to the sources cited. In order to allow us to create links to abstracting and indexing services, such as Scopus, CrossRef and PubMed, please ensure that data provided in the references are correct. Please note that incorrect surnames, journal/book titles, publication year and pagination may prevent link creation. When copying references, please be careful as they may already contain errors. Use of the DOI is highly encouraged.

A DOI is guaranteed never to change, so you can use it as a permanent link to any electronic article. An example of a citation using DOI for an article not yet in an issue is: VanDecar J.C., Russo R.M., James D.E., Ambeh W.B., Franke M. (2003). Aseismic continuation of the Lesser Antilles slab beneath northeastern Venezuela. Journal of Geophysical Research, https://doi.org/10.1029/2001JB000884. Please note the format of such citations should be in the same style as all other references in the paper.

Web references
As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

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. Using citation 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 from different reference management software.

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:
When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.

Reference style
Text: Indicate references by superscript numbers in the text. The actual authors can be referred to, but the reference number(s) must always be given.
List: Number the references in the list in the order in which they appear in the text.
Examples:
Reference to a journal publication:
Reference to a book:
Reference to a chapter in an edited book:
3. Mettam GR, Adams LB. How to prepare an electronic version of your article. In: Jones BS, Smith RZ, editors. Introduction to the electronic age. New York: E-Publishing Inc; 2009. p. 281-304. Note shortened form for last page number. e.g., 51-9, and that for more than 6 authors the first 6 should be listed followed by 'et al.' For further details you are referred to 'Uniform Requirements for Manuscripts submitted to Biomedical Journals' (J Am Med Assoc 1997;277:927–34) (see also http://www.nlm.nih.gov/bsd/uniform_requirements.html).

Video
Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video 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 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 file's content. In order to ensure that your video or animation material is directly usable, please provide the file in one of our recommended file formats with a preferred maximum size of 150 MB per file, 1 GB in total. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including ScienceDirect. 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 data. For more detailed instructions please visit our video instruction pages. Note: since video 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.
**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
- Phone numbers

All necessary files have been uploaded, and contain:

- All figure captions
- All tables (including title, description, footnotes)

Further considerations:

- Manuscript has been ‘spell-checked’ and ‘grammar-checked’
- References are in the correct format for this journal
- 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)
For any further information please visit our customer support site at https://service.elsevier.com.

**Permissions**

To use information borrowed or adapted from another source, authors must obtain permission from the copyright holder (usually the publisher). This is necessary even if you are the author of the borrowed material. It is essential to begin the process of obtaining permissions early; a delay may require removing the copyrighted material from the article. Give the source of a borrowed table in a footnote to the table; give the source of a borrowed figure in the legend of the figure. The source must also appear in the list of references. Use exact wording required by the copyright holder. For more information about permission issues, contact permissionshelpdesk@elsevier.com or visit https://www.elsevier.com/about/policies/copyright/permissions.

Permission is also required for the following images:

- Photos of a product if the product is identified or can reasonably be identified from the photo
- Logos
- Screenshots that involve copyrighted third-party material, whether a reasonably identifiable user interface or any nonincidental material appearing in the screenshot

**AFTER ACCEPTANCE**

**Proofs**

One set of page proofs (as PDF files) will be sent by e-mail to the corresponding author (if we do not have an e-mail address then paper proofs will be sent by post) or, a link will be provided in the e-mail so that authors can download the files themselves. Elsevier now provides authors with PDF proofs which can be annotated; for this you will need to download the free Adobe Reader, version 9 (or higher). Instructions on how to annotate PDF files will accompany the proofs (also given online). The exact system requirements are given at the Adobe site.

If you do not wish to use the PDF annotations function, you may list the corrections (including replies to the Query Form) and return them to Elsevier 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 scan the pages and return via e-mail. 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. It is important to ensure that all 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.

**Offprints**

The corresponding author will, at no cost, receive 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.

**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.