Amending published articles: time to rethink retractions and corrections? [version 1; referees: awaiting peer review]

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Abstract

Academic publishing is evolving and our current system of correcting research post-publication is failing, both ideologically and practically. It does not encourage researchers to engage in necessary post-publication changes in a consistent way. Worse yet, post-publication 'updates' can be misconstrued as punishments or admissions of misconduct.

We propose a different model that publishers of research can apply to the content they publish, ensuring that any post-publication amendments are seamless, transparent and propagated to all the countless places online where descriptions of research appear. At the center of our proposal is use of the neutral term “amendment” to describe all forms of post-publication change to an article.

We lay out a straightforward and consistent process that applies to each of three types of amendment that differ only in the extent to which the study is amended: minor, major, and complete. This proposed system supports the dynamic nature of the research process itself as researchers continue to refine or extend the work, and removes the emotive climate particularly associated with retractions and corrections to published work. It allows researchers to cite and share the most up-to-date and complete versions of articles with certainty, and gives decision makers access to the most up-to-date information. Crucially, however, we do not underestimate the importance of investigations of potential misconduct. This proposal allows two interrelated processes - amendment of articles and investigation of misconduct - to be uncoupled temporally, allowing a more rapid correction of the literature at a journal while institutional investigations take place, without either having to follow the others’ timeline.
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Introduction

Academic publishing is evolving. It is no longer the case that, once published, articles remain unchanged for ever. It is also no longer the case that the final published version is the only version that is made public. Increasingly, preprints, datasets and authors’ accepted versions (and revised versions) of manuscripts, are made available via a variety of mechanisms. A key question that needs to be addressed in the context of this evolving landscape is: are we well-served by the notion of a ‘version of record’ that is static post-publication?

This article reviews current ‘best practices’ for amending published articles and discusses problems that are encountered as a result. We suggest an alternative system, first proposed in a preprint which challenges current thinking but proposes a future solution. We highlight seven key principles that we believe do, and should continue to, apply to the integrity of the literature, the approach to authors suspected of misconduct, and how best to resolve these potentially conflicting issues (Figure 1).

The main guideline for journals, publishers and other publishing organisations handling retractions is the Committee on Publication Ethics (COPE) Retraction Guidelines, published in 2009. Although the guidelines have been helpful, their consistent implementation has proved more difficult as publishing has evolved. Nonetheless, the guidelines, combined with regular discussion between editors, have provided a core framework for handling retractions that now covers many disciplines and countries. Of particular importance has been the repeated assertion of the overarching intention of the guidelines to assist in correction of the literature, whatever the cause. Thus, a first key principle is that the publisher’s role is to maintain the integrity of the literature. A second principle enshrined in the COPE’s Retraction Guidelines is that in cases where misconduct is suspected, it is the role of the authors’ institution or employer to investigate and provide a ruling. As in all legal and quasi-judicial systems, the accused are considered innocent until guilt is proven. Currently, in our experience many retractions occur only after such an investigation has been completed, and investigations can take many months or even years. The need to be fair to the authors and the need to maintain the integrity of the literature are therefore in opposition during the period that an investigation is underway.

We are by no means downplaying the need for rigorous investigation and, if needed, sanctions for potential misconduct. By contrast, we believe that our proposal would strengthen such investigations by ensuring that amendments to the literature and investigations can happen independently. This procedure is standard for many other areas where rapid notification of an incident is required; the notification for example of a consumer product failure happens as quickly as possible; the investigation of the cause and the application of any sanctions happens after due process has occurred, often much later.

Current and evolving best practices

The traditional publishing workflow was originally established to facilitate robust peer review within a print publishing paradigm and is carried out with very little variation amongst conventional publishers (Figure 2). Following publication, however, the traditional scholarly communications process gives way to

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**Seven Key Principles for Amendments**

1. The publisher’s, journal’s and editor’s roles are to maintain the integrity of the literature.

2. In cases where misconduct is suspected, it is the role of the authors’ institution or employer to investigate and provide a ruling.

3. Rapid amendments that imply no fault on the part of the authors until or unless any case against them is proven are central to fair and responsible publishing.

4. Neutral terminology which ascribes no fault to any party is necessary when correcting published work. Reporting of misconduct is a separate issue and should also occur.

5. All changes made post-publication should be transparent and all versions of an article should be preserved.

6. The idea of a journal article as a monolithic object standing for all time unless formally retracted is no longer tenable, given the dynamic nature of scholarly progress and its enabling technologies.

7. Both human and machine readers should be able to trace the full history of an article with ease, and should by default be taken to the most recent version of any article.

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*Figure 1. Seven key amendment principles.*
“best practices.” For concerns raised about an article, or author-initiated changes, there are a number of approaches that can be taken to correcting an article, depending on the scale of the issue. Small errors which do not undermine the findings of the published article can be resolved with a ‘correction’. Historically, some printed journals used to distinguish between errata and corrigenda, according to whether the author or the journal introduced the error - a now meaningless and poorly understood distinction. In other more recent situations, a comment, editorial or blog (or sometimes many tweets and blogs⁵) have been helpful in providing commentary with or without a correction to the article itself. Letters to the editors also have a long tradition as a place for signed criticism, (e.g. rapid responses and letters at The BMJ⁶, although many journals do not allow letters. PubMed Commons⁷ also offers a place for any qualified individual to comment on any article that is indexed in PubMed.

Where an article is so seriously flawed or erroneous that the findings can no longer be relied on, then the method of correction is typically wholesale i.e. the article is retracted. COPE guidelines on retraction advise retracting articles if the main findings are found to be unreliable, redundant, plagiarised or if the authors have reported unethical research or failed to disclose a major competing interest which could influence the interpretation of the article. COPE’s intention was to offer practical guidance and not be overly prescriptive (for example the guidelines deliberately did not contain information about the process of retraction and the wording to be used). The guidelines also do not offer guidance on what is to be done after a retraction. For example, some publishers are now experimenting with retracting and replacing an article in its entirety, for example, “retract and replace” by the JAMA network⁸. In other situations, where it is unclear whether a retraction will be the final outcome, ‘Expressions of Concern’ typically flag issues that do not yet have a final resolution⁹,10. A recent study has made plain the inconsistent and variable way ‘Expressions of Concern’ have been used in the past 30 years¹¹.

These approaches were designed to help resolve issues with published articles while maintaining the integrity of the research literature - preserving the original article for the record. But increasingly, such approaches are inconsistently adopted by researchers and editors because they seem a less than perfect response to an evolving literature in the digital age. In parallel, readers are becoming accustomed to news sites and blogs posting rapid corrections when errors occur. Also, sites that encourage anonymous discussion of research, e.g. PubMed Commons¹² have provided a route for all readers to comment in an only lightly moderated way on research articles, and to continue commenting while institutions attempt to investigate. Thus a third principle is the need to be able to correct rapidly, while implying no fault on the part of the authors until or unless any case against them is proven.

A fundamental underlying problem
To date, we have observed a bewildering variety of notices on articles posted after publication. We have captured nine most commonly used and point to examples in Table 1. Furthermore, many of these are implemented differently by different publishers. No standard taxonomy of updates exists for publishers to adopt. This leads to inconsistencies from journal to journal and potential confusion for the reader.

Moreover, a lack of willingness to engage in proper post-publication correction and amendment of the literature is further exacerbated when any type of post-publication ‘updates’ are misconstrued as punishments or admissions of guilt. This is particularly the case with retraction, a term which many feel has come to be loaded with blame and recrimination. It is fair to say that no one who has been involved with the retraction of an article – either as an editor, publisher, reviewer or author - has ever walked away from the process feeling wholeheartedly good about the experience. This is the case even if a retraction is done for the best of reasons – a genuine, no fault mistake¹⁰,¹¹. As a result, we believe a ‘retraction’ will never be fully embraced as a positive outcome by researchers.

There is a fundamental misconception that retractions are ‘bad’ without pausing to ask why the retraction took place. A fourth principle is, therefore, that we need neutral terminology for the method of correcting published work that implies no fault on any party. In order to provide this, it is important to distinguish the correction of the published record from any investigation or description of misconduct that has occurred. If misconduct or fraud has occurred, this should be reported on, but such reporting should be considered as distinct from the process of correcting the literature.

Figure 2. Publishing outline from HEFCE³.
Table 1. Common amendments currently in use.

<table>
<thead>
<tr>
<th>Amendment</th>
<th>Uses/purpose</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retract and replace</td>
<td>Alert readers to major errors not the result of misconduct</td>
<td><a href="http://jamanetwork.com/journals/jamapsychiatry/fullarticle/2466828">http://jamanetwork.com/journals/jamapsychiatry/fullarticle/2466828</a></td>
</tr>
<tr>
<td>Partial retraction</td>
<td>Alert readers to a problem with an aspect of the article</td>
<td><a href="http://www.neurology.org/content/88/7/721.1.short">http://www.neurology.org/content/88/7/721.1.short</a></td>
</tr>
<tr>
<td>Expression of Concern</td>
<td>An issue has arisen but outcome is undecided</td>
<td><a href="https://translationalneurodegeneration.biomedcentral.com/articles/10.1186/2047-9158-3-18">https://translationalneurodegeneration.biomedcentral.com/articles/10.1186/2047-9158-3-18</a></td>
</tr>
<tr>
<td>Mega correction</td>
<td>Alert reader to extensive corrections</td>
<td><a href="http://retractionwatch.com/category/by-reason-for-retraction/mega-corrections/">http://retractionwatch.com/category/by-reason-for-retraction/mega-corrections/</a></td>
</tr>
<tr>
<td>Correction/erratum</td>
<td>Alert reader to small problem that does not change the article conclusions</td>
<td><a href="http://journals.plos.org/plosone/article?id=10.1371/annotation/dcde3f9c-4be2-40a0-b9a2-152f6772f6bd">http://journals.plos.org/plosone/article?id=10.1371/annotation/dcde3f9c-4be2-40a0-b9a2-152f6772f6bd</a></td>
</tr>
<tr>
<td></td>
<td>Alert reader to authorship changes</td>
<td><a href="http://journals.plos.org/plosone/article?id=10.1371/annotation/d598d976-2604-429b-a76f-14ae6a29a8e">http://journals.plos.org/plosone/article?id=10.1371/annotation/d598d976-2604-429b-a76f-14ae6a29a8e</a></td>
</tr>
<tr>
<td>Editor’s Note</td>
<td>An issue has arisen but outcome is undecided</td>
<td><a href="http://journals.plos.org/plosone/article/comment?id=info:doi/10.1371/annotation/28283552-3fc4-4dc9-9474-5034816e91e2">http://journals.plos.org/plosone/article/comment?id=info:doi/10.1371/annotation/28283552-3fc4-4dc9-9474-5034816e91e2</a></td>
</tr>
<tr>
<td>Comment</td>
<td>Sometimes used to alert readers to small typos in article</td>
<td><a href="https://www.ncbi.nlm.nih.gov/pubmed/26701674#cm26701674_14209">https://www.ncbi.nlm.nih.gov/pubmed/26701674#cm26701674_14209</a></td>
</tr>
<tr>
<td>Version</td>
<td>Alert readers to revisions on article</td>
<td><a href="https://f1000research.com/articles/5-2741/v2">https://f1000research.com/articles/5-2741/v2</a></td>
</tr>
</tbody>
</table>

Such a separation is especially important as those who are likely to be responsible for an investigation into misconduct will be different from those issuing any correction of the published record, and the two may need to happen on quite different time frames. During this time, we feel it is important to alert readers to the possible issues with the published work, and to update the literature without awaiting the final outcome of a lengthy investigation\(^1\). Once any investigation is complete, however, its outcome should be recorded on any it has considered.

Although corrections may not be as universally disliked as retractions, once an article has more than one or two corrections, in the current publishing system it is difficult to track what has happened. Tracking corrections is even more challenging when they are documented outside of the publication itself. For such ‘external corrections’ tracking is arguably even more crucial, as articles (as well as references to them) increasingly propagate across the internet and often do not link back to one version of record. However, developments such as Crossmark\(^1\) are beginning to address this issue. Furthermore, there are no universal guidelines for corrections, and editors and publishers often act on a case-by-case basis. Many editors and publishers struggle with the need for a correction notice for a very minor amendment to an article (such as a typographical error that has no effect on meaning), while many readers feel that all amendments post-publication need a clear audit trail. Our fifth key principle is that all changes made post-publication should be traceable and all versions of an article should be preserved. The circumstances in which an article should be removed (for ethical, legal or safety reasons) are extremely rare, and even in these cases a metadata record should remain, alongside an explanation.

**Now is the time for change**

There are better approaches for amending scholarly communications post-publication. Examples from newspapers and blogs [e.g. 15] take a simple approach to corrections which are effective, speedy and user-friendly. However, these types of outlet rarely require any cross-referencing to external articles and hence the process is much simpler than for academic research articles.

While we reaffirm the importance of preserving the integrity of the published literature, we equally strongly affirm that research outputs are now dynamic objects online. Our sixth key principle...
is that the idea of the journal article as a monolithic object that will
stand for all time unless formally retracted has gone. Rather we are
seeing calls for articles to be viewed as organic publications or “liv-
ing articles”16. If this idea is to be accepted, it is critical to ensure
that updates to the scholarly record of a publication are appropri-
ately made and that they properly link the latest update to the origi-
nal record. Readers need a complete history of changes to an article.
We now have the technical tools at hand to do this, and indeed a
number of publishers now publish successive versions. These ver-
sions can be elegantly handled for readers online by making it clear
which version is being displayed and by employing links to help
readers navigate between versions (e.g. F1000Research1). Cross-
mark also provides a vital insurance mechanism, as it displays the
publication history consistently across publishers14. Our seventh
key principle is that both human and machine readers should be
able to trace the full history of an article with ease, and should by
default be taken to the most recent version of any article.

We now have the technical tools to ensure there is clear notation of
version history in the citation record. The digital object identifier
(DOI) is central to this as a unique alphanumeric string that identi-
cifies the content and provides a persistent link to the location of
each resource on the Internet. It is an actionable identifier as it resolves
to (i.e., takes the user to) the corresponding resource online. It is
also descriptive as it binds the DOI to specific metadata about the
digital object.

To support versioning, publishers could assign a new DOI (or,
more logically a DOI with a suffix), to each version, and link to
the previous version in the metadata record. Crossref ensures that
all versions are linked through the relationship metadata included
in the record. Once deposited with Crossref19, all versions could
be threaded together20 through their DOIs and made available to
systems across the research ecosystem. This practice provides spe-
cificity and precision to the citation record that has not been possi-
ble before. Researchers can thus cite a specific version, rather than,
unintentionally, the original one. Essentially, we can now, technol-
ogically, think beyond the article of record to a number of versions,
whether they are preprints or postprints in institutional copies. The
primary challenge, however, is facilitating publisher (and perhaps
institutional) adoption and implementation of practice to deposit
and update metadata records as changes occur.

If a fundamental change in how we amend published articles is to
be successful, we need both the technology to make it happen (as
outlined above) and the will and support from the community to
embrace the change.

A proposal for the future

The amendment model

In order to facilitate a more reliable and useful scholarly litera-
ture, we propose the following components of handling changes to
published articles. The changes can be implemented by the same
journal (or other publishing venue) that published the original
research and be linked to the original article. We propose removing
the terms correction and retraction altogether and instead using the
term “amendment” to describe all forms of post-publication change
to an article.

The term “amendment” carries a neutral tone and is generic enough
to apply to a wide array of cases, including the smallest instances
such as a typographical error all the way to wholesale withdrawal
of an article. By employing a uniform term, we hope to remove any
associated stigma in the context of scholarly literature. When read-
ers encounter each amendment, they can read the notice for details
on each change, and can judge the article and its revisions on their
own terms.

We considered alternative names such as “update” but we felt they
imply progress or addition. In particular, we strongly feel that
retaining the word “retraction” even for the most egregious instances
of scientific malpractice would further perpetuate the problem
of stigma and is thus not desirable.

We propose an amendment model made up of three different types:
minor, major, and complete (Figure 3). These are distinguished
by the scale of change entailed. Minor amendments cover small
changes such as typographical errors, or other minor amendments
to the content or metadata that has no effect on the substance of
the article. Issues currently worded as corrections belong as Major
amendments, but might also include clarifications and addenda
(which are not currently easy to make under most current publishing
workflows). Amendments of this type would make changes to one
or two small parts of the article but not its whole message. Exam-
ple changes are in authorship, correction of one figure or method,
or additional data or discussion. Lastly, Complete amendments
covers situations where the article as a whole is considered unreli-
able in its current form. There may be elements that remain ‘cor-
correct’ but large proportions are not. Instead of “retract and replace”
as currently practiced by some publishers, we would recommend
“retract and republish” with a new DOI that resolves on the newer
version and makes plain the chain of events. In cases where authors
and/or journal may wish to dissociate themselves from the original
article completely, this can be noted with a complete description in
the associated narrative and no attempt to insert new text or other
content. We would emphasise the importance of using the single
neutral term ‘complete amendment’ to cover all types of retrac-
tion including those for honest errors retractions and misconduct.
The narrative should include explanation of why the amendment
is being made, and can report on any misconduct allegations
once they are known and proven. However, an amendment could
nevertheless be made initially without awaiting the outcome of
any misconduct allegation or investigation.

The amendment notice

The notice (for all amendment types) is comprised of a declaration
followed by key details. The declaration is posted at the forefront
of the document stating that: “The authors and/or the journal wish
to make the following amendment to the published article [article
full reference].” We envisage this declaration being authored most
often by the authors of the original article, in consultation with the journal or publisher, but the format allows for the possibility that a journal or publisher can amend an article without an author’s consent if that proves necessary. In either case the source of the amendment will be clearly visible to readers.

Every amendment notice would then include the following:

a) *Who* is issuing the notice (an author, all authors, editor, journal, publisher, institution), and whether any of this group dissents from the notice. The CReDIT taxonomy might be applied to specify the role entailed in crafting the amendment.

b) The *type* of amendment (as above)

c) *Link* to the article that is being amended as well as other relevant links to associated resources

d) *Date*

e) Associated *narrative* (optional for minor amendments). This is particularly critical in the case of removal of an article without replacement: there needs to be some narrative notice that indicates the reason. This should be updated as needed with links to any investigation if that is publicly available.

The process of the amendment within the publication lifecycle is straightforward and consistent for all types of amendment. Whether the incident at hand merits a minor, major, or complete amendment, the publisher can issue the notice, assign a new DOI to it, register it with Crossref and link to the target publication. Moreover, the same process is also consistent and streamlined to apply at a higher level to include all the various versions of the publication from the original publication to the posting of amendments (Figure 4).

Publishers register all amendments and versions of the paper as they currently do now with Crossref. Each amendment is assigned a DOI, and its metadata should contain a link to its associated article. This links the amendment notice and specific version of the paper in both directions. When a subsequent version of a paper is published, the publisher registers it with Crossref with a new DOI so that it can contain its own, independent set of metadata.

The metadata should contain a link to the previous version, thereby creating a sequential chain across multiple updates.

This version of scholarly communications supports the dynamic nature of the research process, as researchers continue to refine or extend the work. They can publish updates along the way, sharing their latest findings, analysis, and conclusions. For each version of an article an amendment can be issued. In each case, the publisher assigns a new DOI and deposits the metadata with Crossref so that researchers can cite with clarity and specificity.

**Amendment display and linking**

While the proposed amendment model simplifies the process by which published results are shared and updated, it also increases the potential number of components that might be published from a single set of research results. As such, linking amendments to their associated articles and across individual versions needs to be carefully implemented online so readers can easily navigate between versions.

Since every publisher employs their own specific design approaches to content delivery, we recommend the following linking and display strategies to ensure that amendment display fully supports editorial intent (Figure 5). We also illustrate the proposed amendment model, to a generalised case in Supplementary file 1 that contains elements of a number of COPE cases.

**Linking.** Link from each amendment to the respective article it amends and vice versa, so that the reader can easily navigate back and forth between the notice and the research itself. Also link general amendments to their respective article version to ensure that the amendment notice links back to the specific article version to which it amends. And in the event of a correction to a figure legend, the link should direct users to the latest version of the article, complete with the correct figure legend. Readers can then go back and look at it with the wrong legend as they wish (i.e. be transparent about the change). This is akin to the journalistic model and is much cleaner.

**Article versioning.** Each article version has its own DOI and URL, which persists even with the publication of subsequent versions. Where the reader is on an outdated version, clearly
communicate its date on the article and provide a prominent link to the most up-to-date version. Provide a clean and simple way for readers to navigate to and from each version. In cases where the publisher is linking to the article in general (e.g. from a journal home page, etc.), directing users to the latest version is recommended.

**DOI handling.** Although any two DOIs can be linked via Crossref to explain the relationship between versions of an article, or between an article and an amendment, we suggest that the relationship between these would be more obvious to human readers if the original article’s DOI were given a suffix (e.g. https://doi.org/10.1136/bmj.j1072.1; https://doi.org/10.1136/bmj.j1072.2, etc.). Furthermore, The DOI should direct users directly to the specific document at hand, which corresponds to the precise version at hand. (This goes hand in hand with the recommendation to assign a new DOI to each version.)

**Amendment metadata and propagation**

All amendments must be evident to readers and machine harvesters of the literature. They must be inextricably and permanently linked to the original article and also propagated to systems that index articles. Some instances of complete amendments would mean publication of a new article, with a new DOI linked to the original article.

For publication updates to reach all the places online where articles are read, indexed, shared, discussed, recommended, etc. publishers need to make the metadata available in a central store where the data is freely available for systems and applications to consume. Crossref currently provides this facility and their metadata framework fully supports full disclosure of amendments. Once metadata updates are available from publishers, systems need to apply the latest information wherever the publications affected may appear online. All metadata are openly licensed for reuse, propagated through a variety of interfaces and formats via Crossref APIs.

Anyone can search the published literature (humans and machines) to find the latest updates for any publication regardless of origin in the Crossref corpus (85+ million publications at time of writing). Publishers can flag this not only in their own content (online and PDF versions) via Crossmark, but also in the references of papers they publish. They can propagate these notices through other delivery channels offered such as email alerts, RSS feeds, recommendations, and so on. Non-publisher platforms such as indexers, reference managers, recommendation systems, social bookmarking tools, researcher profile systems, and others, can apply the update information and bibliographic metadata to the content they display as well. This information is also potentially useful for research information systems used by funders and research institutions, which also track scholarly outputs.

**Conclusion**

Our current system of correcting research post-publication is failing both ideologically and practically. We propose a model that publishers of research can apply to the content they publish which ensures that any post-publication amendments are seamless, transparent and propagated to all the numerous places online where descriptions of research appear. We believe that this proposal puts in place a system which both incorporates new technological thinking and removes the emotive climate now associated with retractions and corrections to published work. It also exploits the opportunities of new technologies to allow researchers to cite and share the correct
versions of articles with certainty. Furthermore, it allows readers to have the most up to date information in order to support academic research. We recognise that there are aspects of the model that need to be further refined, including for example how to handle changes in authorship. We look forward to initiating a pilot test of our model to learn how it could work in practice, please contact us if you are interested in testing this model.

There is a growing openness in various aspects of research and movements towards linked documentation of the methods, results and discussions derived from such research. We envisage a future with a fully seamless means of publishing that starts with protocols and registered experiments then moves to results publication and data sharing and finally onto revisions, with version control. This system incorporates easy amendments, which are themselves integrated with the articles they amend; articles may have multiple versions. “No fault” amendments will be enabled and encouraged, and reporting on the changes that need to be made to an article may be separated in time from the reason the changes happened. The degree of reliability of a study will be separated from the notion that the author and/or a prestigious journal provides an absolute guarantee for the work. In all cases by default a human or machine reader will see the most recent and up-to-date version, but they will also be able to navigate to previous versions. There will be full disclosure of publication history and metadata that is made freely available to humans and machine applications.

Competing interests
VB is the Director of the Australasian Open Access Strategy Group. She also works part-time for Queensland University of Technology (QUT), Brisbane as a Professor in the Office of Research Ethics & Integrity and in the Division of Technology, Information and Library Services. She was the Chair of COPE until May 2017 and was a COPE Trustee until November 2017. She is also an Editorial Board Member for Research Integrity and Peer Review. TB is Executive Editor of The BMJ. She chairs the scientific advisory board of EMBL-EBI Literature Services. JL is Director of Product Management at Crossref. She serves on the Dryad digital repository board. ECM is Senior Editor (Peer Review Strategy and Innovation) at BMC (part of Springer Nature). She is also a COPE Council Member, an Editorial Board Member for Research Integrity and Peer Review, a member of the Advisory Board for EnTIRE (an EU proposal for Mapping the research ethics and research integrity framework) and mentor for MiRoR (Methods in Research on Research).

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Provenance
This work was conducted as part of an ongoing open discussion within an initial working group and a wider consultation. COPE convened the working group that wrote this paper. This is one of the ways that COPE helps foster high-quality and progressive discussions that, one day, may be reflected by changes in practice. This paper and the ideas presented within it exemplify COPE’s commitment to collegial discussion and debate.

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Supplementary material
Applying the amendment model: an illustration.
Click here to access the data.

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   Reference Source
   Reference Source
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