

Copyright transfer in group-authored scientific publications

Academic publishers have different definitions of multiple authorship and ghost/guest authorship. When a scientific paper is submitted to a journal, the general assumption is that its ethics and authorship-related rules have been respected. Copyright transfer is a central issue in the flow of scientific information. To familiarize more academics with this topic, we examine the issue of copyright transfer from authors to a publisher. A key argument is the potential invalidation of a copyright transfer agreement if one or some of the co-authors do not authorize the transferring author to sign the agreement on their behalf.

Keywords

collaboration; copyright; ethics; guest; ghost and gift authorship; joint authorship

Academic authorship

Authorship is of great importance in science publishing and has multiple functions,¹ including intellectual contribution for the research conducted,² and responsibility and accountability for the published work,³ as a currency for the quality of the published research and as credit for the authors as they advance their scientific careers.⁴ Collaborative research projects involve the division of professional labour to achieve desired objectives and this has caused a global expansion in the number of multi-authored publications.⁵

In the face of increasing collaboration globally,⁶ even though multiple authorship became common in the past decade or so,⁷ until quite recently, there were considerable differences and disparities in the definitions of authorship among leading publishers, ethical bodies, or in the ethical guidelines of research institutes and universities.⁸

The lack of clear guidelines and the frequent inconsistencies in the definitions of authors have resulted in unethical authorship practices⁹ and a decrease in accountability,¹⁰ across multiple scholarly disciplines.¹¹ There is also considerable variation in the meaning or the concept of authorship not only between common law and civil law jurisdictions, but within different legal systems.¹² The inconsistencies in authorship definitions or violations of valid authorship such as ghost authorship, medical writers¹³ or guest authorship (e.g. honorary authors),¹⁴ which, even though legal under copyright law,¹⁵ can raise ethical questions in science publishing and might cause problems when solving authorship disputes and conflicts when these arise.¹⁶

Ghost authorship is when the true identity of the actual author, i.e. the person who wrote the paper, or contributed substantially to the intellectual work, is masqueraded, and when named persons on that paper take credit for the work of the real author.¹⁷ If this is done for a fee, then it is a form of 'on-demand' publishing, which is unethical.¹⁸ Guest authorship is the inclusion of an individual who has not contributed sufficiently to the planning, development or intellectual content of a paper to merit authorship, but who may be included anyway because of their 'brand name', i.e. a famous, powerful or influential person who gives the manuscript an air of greater importance simply by being there.¹⁹

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2 In order to show the extent of this problem, Wislar et al. investigated inappropriate authorship by surveying 630 corresponding authors of articles published in 2008 in general medical journals with the highest Clarivate Analytics' journal impact factors, and found evidence of honorary and ghost authorship in 21% of those articles.²⁰ Macfarlane found that in Hong Kong, 'considerations related to hierarchical power relations, notably in relation to research project leadership and doctoral supervision' tended to outweigh intellectual contribution, calling into question the cultural perspective of publishing ethics in the social sciences.²¹ This phenomenon has also been referred to as the 'White Bull effect' in which the naïvety of junior students or colleagues is exploited by more powerful senior researchers.²² Although several authorship credit schemes have been developed over the years in an attempt to quantify the contribution of each author,²³ authorship guidelines do not provide adequate help,²⁴ and the misuse of authorship criteria, such as coerced authorship, is common practice in academia.²⁵

The intersection between authorship and copyright

The issue of authorship misrepresentation can be a significant challenge to the validity of copyright transfer from author(s) to publishers. Despite the variation in journals' descriptions of authorship criteria,²⁶ the normative expectation is that authors who participated in the creation of the work (i.e. the published paper) are the owners of copyright in the resulting scientific paper. Needless to say, such ownership can be subject to agreements between the author(s) and their employers, in particular if the work is 'work made for hire', i.e. an agreement that the employer is the owner of works made during the period of employment, at least in those jurisdictions that recognize such a concept.²⁷ In traditional subscription (print) journals that require copyright transfer, publishing a paper typically requires the transfer of copyright from the copyright holder to the publisher.²⁸ Copyright holders can be the author or the author's employer if the work is made for hire.²⁹ In multi-authored joint works, the copyright owner is a group of authors, including heirs of a deceased author, given that copyright is transferable like any other property.

'The issue of authorship misrepresentation can be a significant challenge to the validity of copyright transfer'

However, even though the owner(s) of copyright in research output is presumed to be – and typically initially vests in – the author(s) who created the work absent any other agreement, in some settings, universities may have policies that restrict this right. University practice goes the other way, too. Works that seem to be 'for hire' in that they were made in the scope of employment, are more often than not owned by the author. Benson dubbed this practice as a 'gifted' copyright, where a university gifts copyright in academic and scholarly work to the authors who created them.³⁰ It is not always clear if only the corresponding author should sign the copyright transfer agreement (CTA), if the corresponding author signs on behalf of all author, or if all authors need to sign the CTA.

Davies assessed approximately 70% of UK universities' intellectual property policies and found that a significant number of those policies had statements indicating that the university, being the employer, is the owner of the work created by its employees during the period of their employment. Davies further explained that the low potential financial value of academics' output is one reason why universities shy away from claiming copyright.³¹ While Davies' interpretation may be more related to universities' customary practices and academic freedom,³² Benson argued that the reason why universities do not claim copyright in articles published by their employees, is that 'the university Board of Trustees does not have the time, energy or will to negotiate every single academic article publishing agreement'.³³ Another plausible explanation is that universities have a compelling interest in improving their ranking, an interest that outweighs any interest in claiming the ownership of copyright in scholarly publications. Our opinion is supported by the fact that some universities offer financial rewards to authors who publish in top tier journals.³⁴ In view of this, the issue of whom a publisher accepts as the owner of copyright at the time of signing the CTA reflects on how publishers safeguard or protect 'appropriate authorship' (i.e. contribution that merits authorship) and we argue that this should be the most central aspect of the validity of CTAs in academic publications.

3 Considering the complexity of legal problems that may be caused by a lack of clear and precise definitions of appropriate authorship with respect to research collaboration and authorship in publisher agreements, we argue that such problems should be anticipated and prevented. However, laws do supply definitions, even when the publishers or practices are unclear, and while these legal definitions may also be unclear, they may define authorship in a legal document such as a CTA.³⁵ It is likely that any dispute with a foreign element will be subject to the laws of different jurisdictions, especially in multi-authored publications. In this article, we limit our discussion to journals and publishers that request the transfer of copyright ownership and we focus on copyright protection using the term 'joint authorship' as provided by the 1886 Berne Convention³⁶ as well as the American copyright law's definition of joint authorship.³⁷ U.S. copyright law indicates that the authors of a joint work are co-owners of copyright in the work. Section 101 of the U.S. Copyright Act (17 USC § 101) defines a 'joint work' as a work prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary whole. Additionally, we also aim to explore the issue of who should sign a CTA and what measures authors and publishers should follow to safeguard (i.e. protect) appropriate authorship and intellect to prevent disputes.

What is copyright and what are the ethical and legal implications?

Copyright is 'a legal right created by the law of a country that grants the creator of an original work exclusive rights for its use and distribution'.³⁸ Fishman defines this right as a legal device that provides the creator of a work (of art or literature) that conveys information or ideas the right to control how the work is used.³⁹ It has been argued that its importance lies in the fact that with copyright, authors are provided an incentive to create and disseminate their work.⁴⁰

The need to provide worldwide copyright protection to foreign authors and foreign works led to the development of the Berne Convention for the Protection of Literary and Artistic works,⁴¹ a universal protection of copyright, and a 'vehicle for the harmonization and development of authors' rights on an international scale' as described by Hatch⁴² and Dinwoodie.⁴³ To meet their obligations, member countries are required to adopt the measures necessary to amend their domestic laws to ensure conformity with the Berne Convention.

As is stated in Article 2 of the Berne Convention, a universal protection of copyright protects 'every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression'.⁴⁴ Hence, all scientific writings by authors enjoy copyright protection in every country of the 179 countries⁴⁵ who are parties to the Berne convention. Furthermore, Article 5(2) states that '...the extent of protection, as well as the means of redress afforded to the author to protect his rights, shall be governed exclusively by the laws of the country where protection is claimed'.⁴⁶ With respect to heirs and successors of deceased authors, Article 2(6) indicates that 'The works mentioned in this Article shall enjoy protection in all countries of the Union. This protection shall operate for the benefit of the author and his successors in title'.⁴⁷

In multi- or group-authored scientific publications, absent any other agreement, copyright laws provide protection for authors who collaborate in scientific works along the way, so that each author expresses ideas and exchanges them with other co-authors with the intention of creating a research paper⁴⁸ before their collaborative writing is finalized in a joint work whose copyright is co-owned by the authors.⁴⁹ However, in order to disseminate the results of their research, and to meet their job requirements, they should publish their research findings and thus will have to assign their rights to their work to publishers by signing a publisher's CTA, if they choose to publish their findings in journals that request the transfer of copyright ownership. In the latter case, after signing this agreement, authors transfer all their rights of their work to the publisher who becomes the new copyright owner, subject to any rights retained or licences back to the authors that are often expressed

4 in those agreements. In situations where the author signs a journal's CTA rather than a publisher's CTA, the norms of publishing imply that the editor of the journal transfers all rights to the publisher as shown in 'one of the publisher's contract with its editor'.⁵⁰

A valid CTA comes into effect when the publisher accepts to publish the scientific paper unless otherwise explicitly stated in the CTA (this may vary in some jurisdictions). This implies that the signed CTA is binding and cannot be invalidated unless legally challenged, since in general, some CTAs may include a provision that the transfer of copyright is irrevocable.⁵¹ Nevertheless, it is possible for an author to request that the agreement be cancelled and thus copyright reverted, on the grounds of misrepresentation by the publisher, for example, lack of peer review when peer review is claimed.⁵² Such a dilemma may arise in an author-publisher dispute given the proliferation of predatory publishing practices where, for example, a publisher falsely claims peer review in order to deceive authors and accepts to publish an article for a fee.⁵³ Although we believe that this example is worthy of further investigation, we propose that the author may request termination of the CTA and retraction of the article on the grounds of material misrepresentation or even fraud in the inducement. Needless to say that without said termination, and in accordance with academic publishing norms, specifically the Ingelfinger rule,⁵⁴ which is a policy followed by most journals, the author(s) will not be able to publish the article with another reputable legitimate publisher since they are required to warrant that the article has not been previously published.⁵⁵ What we propose has grounds: the CTA of the *Asian Journal of Surgery*,⁵⁶ an Elsevier journal, indicates that 'if the Work is accepted for publication. The undersigned authors transfer all copyright ownership in and relating to the Work' and that '[the] agreement will be null and void if the Work is not published in the Journal'. It is thus reasonable to infer that if a published article is no longer 'published' or is retracted from a journal, the CTA becomes null and void, or invalid, at least according to CTAs employed by some journals. And if this inference applies to legitimate journals that are published by reputable publishers, it follows that invalidating CTAs applies a fortiori to articles published in deceptive journals. On this ground, legal action was brought by the U.S. Federal Trade Commission (FTC), which is an independent agency of the United States Government, against the deceptive publishing practices of a mega publisher, namely OMICS.⁵⁷ Interestingly, the FTC's legal action incidentally echoed measures proposed by Al-Khatib,⁵⁸ who invited the scientific community to protect authors and 'selectively cull' 'predatory' journals and publishers or curb their deceptive practices.

To our knowledge, many authors, upon signing the CTA, are unaware that during the full term of copyright, they need to ask the publisher for permission to use or self-archive⁵⁹ the work they originally created. Permission is required absent an agreement to the contrary or if the publisher allows the authors to self-archive, or unless the purpose of such use falls in the category of fair use and other exemptions (for example, classroom teaching or research), provided that the use does not conflict with the 'normal exploitation of a work and does not unreasonably prejudice the legitimate interests of the author'⁶⁰ as stated in Article 9(2) of the Berne Convention, but these limitations vary widely between countries.⁶¹ Thus, some limited use of copyrighted material is permitted without the permission of the publisher, as the rights holder, provided that the work is attributed to the author. Furthermore, some publishers' restrictions, for example Springer Nature's *Scientific Reports*, do not apply to abstracts and press reports published in connection with scientific meetings.⁶² Retained rights of the author(s), after transferring copyright to the publisher, are listed in the publishers' policies; these rights include personal, educational or some institutional posting or use, but always exclude commercial use or dissemination. The full term of copyright varies from country to country but generally ranges between 50 and 70 years after the death of the author or the death of the last surviving author in a joint (multiple authors) publication,⁶³ conforming to the Berne Convention.

'many authors are unaware that they need to ask the publisher for permission to use or self-archive the work they originally created'

Unknown to many, the CTA is negotiable, and authors considering retaining some key rights can attach an author addendum.⁶⁴ However, one possibility may lie in the publisher's interest in obtaining full and exclusive rights, thus in essence rejecting such an addendum and in this case, the authors have the option of either acquiescing to and signing the publisher's CTA,

5 or withdrawing the article and publishing it with another publisher, especially if broader rights retention of the authors' work, in specific journals, is required by their institution.⁶⁵ Nonetheless, authors who wish to retain ownership of some rights can choose to publish in fully or hybrid OA journals that do not request copyright to be transferred, and in such journals authors grant a publisher licence to edit, print and distribute the article.⁶⁶

Upon completing the CTA, the corresponding author is typically required to confirm that he/she qualifies to be author and so does each co-author according to the journal or publisher's guidelines. Unfortunately, those guidelines are often ambiguous and do not always explicitly state authorship criteria, especially in biomedical journals which supposedly follow the authorship criteria of the International Committee of Medical Journal Editors (ICMJE).⁶⁷ The ICMJE guidelines, despite annual updates, continue to carry inconsistencies and ambiguities.⁶⁸ Moreover, several issues remain unclear and may differ between publishers, or even journals within the same publisher. For example, do CTAs explicitly refuse ghost or guest authorship? Should CTAs require the signatures of all contributing authors and/or authors' employers as owners of copyright or as authorizers of the transfer? The warranty section of some CTAs may cover this aspect. Do CTAs ignore heirs as the owners of copyright in the case that one of the authors dies before transferring their publication? Although this issue adds a layer of complexity, in the age of Covid-19 uncertainty, and where death may unexpectedly meet an author at any time, it would be prudent to include a clause that indicates that all authors or their heirs, if the author is deceased, have the power of signature.

Could differing authorship definitions impact the validity of copyright transfer?

Contradictions in authorship definitions might introduce another dilemma about the ICMJE guidelines and the differences in guidelines among different publishers,⁶⁹ which might not correspond to the reality of many cases of research and publishing collaborations. CTAs, particularly of commercial for-profit publishers, are important, as they may limit the extent to which that material can be disseminated by authors. By holding the copyright and the right to reproduce scientific articles, publishers, through a signed agreement, hold the rights to disseminate that content within the confines specified within that CTA. This limit on dissemination poses challenges to institutions who wish for their academics to retain broad rights in articles as widely as possible, through green OA.⁷⁰ In almost all cases, we argue that such a transfer should imply that the rules and guidelines of that journal or publisher have been respected including, where applicable, ethical guidelines, such as those provided by the ICMJE, which almost always invariably include one or more clauses related to authorship. If there is any incompatibility between the ICMJE authorship guidelines and the authorship guidelines of a journal, authors may be confused as to which authorship guidelines they are bound by. In the case of such an incompatibility, in the incompatible case, authors may be perceived as being untruthful by 'misrepresenting' their authorship status.

In other words, we believe that in order to guard the ethics of publishing, copyright should only be transferred if the ethical guidelines, including those pertaining to authorship, are or have been met and respected (at the time of manuscript submission and publication, and signing/transfer of the CTA). If the ethics of authorship have not in fact been truly met, and if the author made false declarations and violated the disclosure form, we argue that the CTA the publisher holds in its hands can be invalidated by an author or by a publisher. In such a case, if the CTA is invalidated on the grounds of misrepresentation or fraud then such manuscripts become subject to retraction simply because the publisher will surely have no interest in copying, reproducing or licensing a retracted article. Our argument is based on the normative question of whether the transfer of copyright was made by the true owner of the work, or by someone either fraudulently or unknowingly claiming copyright ownership, especially given that publishers are not currently required to certify that they are satisfied that the author transferring copyright is authorized by the true author(s) of the work or the

'in order to guard the ethics of publishing, copyright should only be transferred if the ethical guidelines have been met'

6 owner(s) of copyright.⁷¹ The language of the U.S. copyright law states, 'When an individual author's ownership of a copyright, or of any of the exclusive rights under a copyright, has not previously been transferred voluntarily by that individual author, no action by any governmental body or other official or organization purporting to seize, expropriate, transfer, or exercise rights of ownership with respect to the copyright, or any of the exclusive rights under a copyright, shall be given effect under this title...'.⁷² The argument that a publisher receives a non-exclusive licence if some authors fail to sign the CTA, or do not authorize the corresponding author to sign on their behalf, may provide a remedy to authors of books or patents where authors receive royalties, since under U.S. law, joint authors own the work equally and each author may exploit the work as they desire, subject to a duty to account to the other joint author for profit.⁷³ This 'tenants-in-common' approach, however, fails to provide any remedy to an injured joint author of an academic article. This normative question about how to remedy a joint author of a scientific article is likely to arise and it is an issue that merits greater debate among legal academics in co-ordination with researchers and the publishing-related proponents listed in the tables of Teixeira da Silva and Dobránszki.⁷⁴ A detailed analysis of publishers, especially in close-knit groups such as the ICMJE that are bound by similar publishing and/or ethical principles, is needed to assess whether they have a clear clause directly related to authorship in their CTAs.

We have some advice to offer as to how CTAs could be more transparent and helpful to authors. CTAs should give examples of who does not qualify as an author, should explicitly prohibit ghost or guest authors and clauses should imply, rather than assume, that the responsibility for the publication of a paper involves the respect of authorship-related issues. Furthermore, clauses in CTAs should explicitly clarify the relevant contribution of deceased authors or describe their role in transferring copyright to a publisher. This may be a less frequent case, and since lengthening a CTA with additional clauses that might not be directly or immediately relevant to all authors might reduce their readability or comprehension, we suggest that the journal or publisher add such a clause to its website, such as in the instructions for authors. Other issues of authorship responsibilities when deceased authors are involved are discussed elsewhere.⁷⁵ CTAs should ensure that each author of a joint publication (multi-authored publications, absent an agreement to the contrary) and authors' employers in works made for hire sign the CTA or authorize, in writing, the corresponding author to sign the CTA.

These copyright-related issues are of paramount importance since these issues could raise legal challenges through the ambiguity of their wording and elasticity of their clauses and would lead to authorship ethical concerns. This problem may even be aggravated if authors argue that these ambiguous and deficient guidelines are only guidelines and that the interpretation of their ambiguous language could render both compliance and enforcement extremely difficult. Thus, current authorship definitions and guidelines deserve special consideration and debate, which we hope to stoke through the discussion in this paper.

A curious case is the requirement of journals to sign over copyright in the form of a CTA during the act of submission, i.e. even before the manuscript has entered peer review, let alone having been accepted for publication. Such an act could violate authors' rights and could undermine their autonomy, especially when an editor ignores or does not respond to authors' queries about a submitted manuscript that has been undergoing editorial screening for an unreasonably long period of time, and their right to withdraw the manuscript for valid reasons, as discussed elsewhere.⁷⁶

Several plant science Springer Nature journals displayed this practice.⁷⁷ Therefore, we believe that a CTA should only be signed and transferred after a manuscript has been formally accepted for publication, following peer review.

If the publisher implements such a policy, for example to streamline its workflow, then this must be explicitly indicated, to allow the authors to make informed decisions. The final transfer of copyright to a publisher can also signify a mutual understanding that the publisher has conducted proper peer review and that authors have respected publishing

'current authorship definitions and guidelines deserve special consideration and debate, which we hope to stoke'

7 norms and ethical principles. Authorship should thus be confirmed not when copyright is transferred but already when submitting the paper, as generally occurs with warranties by authors upon submission. Although, as discussed above, the most serious question that may arise if authorship is false is a possible impact on the validity of the CTA. This then begs the question, does the copyright of a paper that was signed over to a publisher, upon retraction of that paper, automatically revert back to the author(s)? The answer to this question is most likely yes since copyright reverts to authors who are free to publish the retracted paper in a different journal, especially since a publisher would or should have no interest in exploiting a retracted article.

Needless to say, although a marked retracted article will continue to be published, on the publisher's website, the authors can, and have the right to, submit another non-verbatim version, including an improved or corrected version, of their retracted article to another journal. It should be emphasized that in the cases of joint publications, which is defined by the U.S. copyright law as 'work prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary whole' (17 U.S. Code § 101),⁷⁸ each author is a copyright holder.⁷⁹ Also, according to Fisk, 'it is extremely difficult for one collaborator to claim joint authorship without the express concurrence of other authors'.⁸⁰ Therefore, unless copyright is transferred in writing with the consent of all authors, we argue that the CTA between a non-consenting author and the publisher should be normatively invalid, especially given that a publisher is not able to verify the contribution of, and obtain the consent of, each author prior to the transfer of copyright. In other words, can a publisher confirm that the signee of the copyright transfer is authorized by all other authors to sign on their behalf? If not, then what remedy would be available to a non-consenting author whose co-author submits an article to a predatory or fake journal? Thus, although publishers' CTAs include statements requiring the signing author to warrant that all authors have read and approved the submission of the manuscript, unfortunately, dishonesty and fraud cannot be excluded. As Hanna stated, 'a consensus to falsify the list of co-authors – is regrettably widespread in medical science' (p. 240).⁸¹

Possible solutions

Authorship is central to publishing and copyright transfer. It should be understood that when a publisher requests authors to transfer copyright, the clauses pertaining to the publisher's ethics, including those related to authorship, are valid and respected. By not satisfying authorship clauses, we argue that the paper's group of scientists could subject their published work to retraction.

Academics should be aware, however, that even though they have transferred copyright to journals, societies or publishers, in the world of pirated content, those relationships are ignored. Despite the existence of CTAs, copyright pirates recognize no obligation to authors, societies, publishers, etc. If the CTA is not valid, then a publisher will have difficulty enforcing rights against pirates and plagiarists alike. Although the immediate consequence on copyright is evident, i.e. copyright infringement, the impact on authors' rights is less known. This is an important issue to consider in peer review where predatory peer behaviour involves not only the theft of authors' ideas, but also copyright infringement and plagiarism, or when an infringement involves publishing a duplicate article in a predatory journal.⁸²

'copyright infringement is closely related to depriving the owners of the right to exploit their work for revenue'

In this context, the concept of 'plagiarism', which can overlap with copyright infringement, applies to ideas and expression, while copyright generally protects the arrangement of words in an expression of ideas but not the mere ideas. Another difference is when copyright has expired. Although verbatim copying without attribution to the author is unethical plagiarism, such copying is not copyright infringement where the rights have expired. This distinction may also be true if copyright has not yet expired, but if content is used under 'fair use' without attribution to the author (the creator of the work). In other words, copyright infringement is closely related to depriving the owners of the right to exploit their work for revenue, while plagiarism is depriving the

8 authors of attribution, and stealing credit for the authors' original ideas.⁸³ Sensu lato, whereas copyright could be considered a legal issue, plagiarism would be an ethical one.

Therefore, we believe that because copyright enables most publishers to own, disseminate and control all research articles published in their journals, publishers are responsible for the integrity and accuracy of the scientific record, and should thus implement the practice of ensuring that all copyright owners consent and authorize the transfer of copyright from the true owners to a publisher prior to publication of scientific articles, including peer review reports if the publisher employs open peer review, since peer reviewers are the owners of copyright of peer review reports.

We also believe that the publishers' obligations include guarding the validity of authorship, and given their position in the academic world, they have a role to play in promoting adherence to the principles of publication ethics, responsibility and accountability. To further emphasize the issue of authorship at the journal level, COPE recommended that 'Journals should consider requesting that all named authors sign a statement of authorship as a condition of publication'.⁸⁴ This clause has some practical limitations: while it might be easier to enforce this requirement in a journal that publishes a limited number of manuscripts, it would be practically impossible to achieve in journals with a turn-over of dozens or hundreds of papers per year, even less so when papers may contain over a dozen, if not more, authors. It would also be impossible to verify the authenticity of the signatures.

Therefore, journals should have, as a standard practice, policies in place that address legitimate authorship which should define the original creators of the published work so that credit is meritoriously granted and so that accountability is held for the published research. That said, publishers should encourage journals to explicitly define acceptable authorship in their respective CTAs and provide clauses pertaining to the seriousness of naming non-contributing authors on a published article.⁸⁵ Furthermore, the CTAs should have explicit jurisdictional and applicable legal clauses because collaboration among authors from different jurisdictions is likely to increase as science and innovations progress.

Not only do journal editors promote ethical practices by protecting the validity of authorship in publications, but journals also prevent the invalidation of CTAs which constitute one of their most valuable assets. Such invalidation can be inferred if the retraction of a publication is caused by authors submitting a paper without the approval of all authors. This inference can reasonably be drawn from a retraction notice by *General and Comparative Endocrinology*, an Elsevier journal, which states, 'This article has been retracted at the request of the editors-in-chief due to a dispute in authorship. The article was submitted for publication by the corresponding author without consent or knowledge of the other researchers involved in the study'.⁸⁶ Despite being a retraction, the article's PDF file is still available from Elsevier, indicating that some rights are still needed to publish.

'journal editors promote ethical practices by protecting the validity of authorship in publications'

In summary, although the validity of authorship is a cornerstone in the CTA between an author and the publisher of research articles, the definitions of legitimate authorship might not be clearly expressed in CTAs. This issue needs to be examined from a legal viewpoint. Nonetheless, we propose the following measures and advice to publishers and attentive authors to prevent the retraction of their published articles:

- 1) Authors whose institutions consider their work to be work made for hire should not sign the agreement alone.⁸⁷ Should they publish an unauthorized work, their employer, as the owner, has the right to invalidate the CTA and the publisher is left with no other option but to retract the published article.
- 2) Authors of a joint work should collectively elect and authorize a representative, in general the corresponding author, to sign the transfer form on their behalf, or each should sign the transfer document. Failure to do so could result in a retraction especially when some authors confirm that they did not give their approval to publish the work, or it could even lead to one author suing their colleagues for stealing credit for joint work.⁸⁸

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- 3) Authors of a joint work should obtain the written approval of their co-authors by signing a document describing the details of their agreement including which author authorizes the transfer of copyright, an approach that would secure authors' rights, especially if one of the contributing authors dies before signing the CTA.
 - 4) Since 'all written works of authorship' are automatically, at creation, protected by copyright, plagiarizing or infringing others' work in a joint work and submitting it to publication without their approval should be considered a serious act of misconduct and could result in a retraction and possibly legal action.
 - 5) On the other hand, publishers, who hold copyright of the major bulk of the scientific record, should adopt policies to protect the validity of their copyright, policies that require clear definitions of acceptable and unacceptable authorship and written signed consent by each contributing author or copyright owner before they publish a submitted manuscript.

The measures we propose would prevent legal disputes between authors, and between authors and publishers, and would save both authors and publishers the burden of answering the question, absent jurisdictional or applicable law clauses in CTAs, of whose law applies to what in exhaustive and lengthy legal battles. Until the international community adopts a global copyright law that would regulate academic publishing in the digital age and would govern conflicts with foreign elements (i.e. conflict of laws), prevention of such disputes would be much better than cure.

'The measures we propose would prevent legal disputes between authors, and between authors and publishers'

Conclusion

The CTA is frequently used both for copyright transfer and for statements of adherence to publication (ethics) conditions as well as confirming authorship, creating a murky border between legal and ethical practices within the same document. There is still a clear lack of consensus regarding the definition of authorship, even among select leading publishers, including those that are COPE members.⁸⁹ In addition, there are still gaps in the process of authorship verification, gaps that widen as the number of authors in a manuscript increases. Aside from guarantees that are provided automatically when the corresponding author submits a manuscript, which is most likely to be through an online submission system, there is no completely fail-safe and systematic manner to verify authorship apart from authors' written declarations. This gap in the verification process is likely to be one reason why the publishing system is being fraudulently abused by increasing cases of false authorship and falsification of facts in the online submission system caused by the existence of citation rings and authorship cartels,⁹⁰ even though publishers are starting to forcefully implement centralized parameters such as the ORCID, a system that may pose risks to academics' fundamental rights and freedoms of choice.⁹¹ There is also a disconnection between legal aspects of what constitutes copyright ownership and the ethics of authorship, as based upon criteria set forth by scientific organizations and/or publishers, and whether invalidation of the latter should invalidate the former. Finally, although this is not meant to be a legal article, we have discussed some legal and ethical implications of multiple authorship in the absence of clear definitions as to what constitutes valid authorship and how this could affect the validity of a CTA. Our hope is that this article may spur further discussion that would bring greater clarity, for authors and publishers alike, and thus better guidance, regulation and verification that would offer stronger protection of authors' and publishers' rights.

Abbreviations and Acronyms

A list of the abbreviations and acronyms used in this and other *Insights* articles can be accessed here – click on the URL below and then select the 'full list of industry A&As' link: <http://www.uksg.org/publications#aa>.

Competing interests

The authors have declared no competing interests.

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