Trends in
Ecology & Evolution

CellPress

Scientific Life

A solution for breaking the language barrier

Rassim Khelifa [1,2,3,8,*,@], Tatsuya Amano,[4,5] and Martin A. Nuñez[6,7]

Global problems require global scientific solutions, but the dominance of the English language creates a large barrier for many non-English-proficient researchers to make their findings and knowledge accessible globally. Here, we propose integrating peer-language proofing and translation systems in preprint platforms as a solution for promoting equity, diversity, and inclusion in science.

Language as an obstacle

More now than ever, there is a need for global unity among researchers to effectively tackle many environmental and societal issues that threaten biodiversity, food and water security, and human health. However, there are substantial impediments to reach this goal because most scientific perspectives to date originate from countries where English is widely spoken, while solving those issues requires global efforts from all scientists worldwide. Unfortunately, researchers from countries where English is not widely spoken face language barriers to sharing their research with the international scientific community [1–3]. English is now widely used in scientific communications, but many researchers whose first language is not English, especially those from developing countries, often find it difficult to improve their English proficiency [4]. While the use of English as a common language improves science communication among researchers in different countries, it also imposes inequalities among countries in terms of the ability of scientists to publish and disseminate their research, impeding the contribution of non-native English speakers to addressing global challenges that require a global perspective. The language barrier also hinders many non-native English-speaking researchers from obtaining essential scientific knowledge [5], posing major obstacles to their career development [6,7]. Nevertheless, scientific communities rarely provide genuine support for non-native English speakers [8]. While recent calls have highlighted the need for urgent measures to increase the representation of non-native English-speaking scientists and to solve inequalities driven by the monolingual system [9–11], we still lack viable long-term solutions to address this obstacle. Here, we propose a novel initiative that could help solve the issue of the language barrier for researchers who are less proficient in English while also benefiting the broader scientific community.

Seeking a proficient English speaker

Many peer-reviewed journals, especially those with a large influence in ecology, now publish in English, and often ask non-native English speakers to have the grammar and spelling of their manuscript checked by an English-proficient person or professional services before submission. However, in reality, most researchers with low English proficiency can rarely find English-proficient people in their research environment. The few people that do have such connections are those who have solid ties to leading institutions in countries where English is widely spoken, such as the USA and UK (e.g., through collaboration, overseas education, or research stays abroad), leaving a large group of scientists with limited connections and no external opportunities for help. Professional academic language editing or translation services are too expensive for most non-native English-speaking researchers [4], and many local non-academic English translators do not provide effective translations of scientific texts. Although there have been some initiatives from some journals to address the language barrier for authors (e.g., buddy/mentoring systems, abstracts and/or main texts in non-English languages in journals such as *Biotropica*, *Nature*, *PLoS Biology*, and *Biological Conservation*), there have been few centralized systems that allow English-proficient researchers to provide peer language proofing to non-English speaking researchers while receiving recognition for their services.

Peer language proofing in preprint repositories

Preprints repositories, such as bioRxiv[i], have revolutionized scientific research because they make science immediately available to everyone before peer-review and publication. These repositories also benefit the authors with valuable informal peer-review before submission. Thus, these platforms have the potential to promote interactions between scientists, particularly between native and non-native English speakers. However, these repositories have not yet reached their full potential to foster these international interactions.

Here, we propose that preprint platforms should integrate new functionalities that help both non-English-proficient and English-proficient researchers: peer language proofing (PLP) and peer language translation (PLT). First, scientists who are proficient in English could voluntarily review the language of manuscripts submitted by scientists who are not proficient in English. Scientists who are not proficient in English could provide translations of abstracts or manuscripts to increase the outreach of papers. Instead of creating a new platform for PLP and PLT that will need funding to build from scratch and a huge promotion to attract scientists globally, it is more strategic to use existing platforms that are already popular, trusted, and sustained by the scientific community. Preprint repositories already have an existing platform for the

interaction of scientists, where informal reviews on the scientific content of the papers are commonly provided and, thus, are good candidate recipients of PLP and PLT.

While the author guidelines of journals do not recognize PLP and PLT as a scientific contribution that warrants authorship, the lack of reward typically discourages English-proficient scientists from spending a substantial amount of time performing language editing. Therefore, linguistic skill trading (PLP for PLT) and a recognition system for PLP and PLT, such as the peer review score in Publons or reputation in Stackoverflow, are ways to foster these activities while rewarding the contributor for their PLP and PLT services [12]. The scientific community, universities, and funders should also acknowledge PLP and PLT as essential services for science and key contributions to promote equity, diversity, and inclusion [8]. These considerations will help PLP to become a sustainable niche in science publishing similar to journal peer-review.

The integration of PLP in preprint repositories should take advantage of existing proofing software, such as e.Proofing developed by Springer[ii]. Almost identical to the review functionalities of Microsoft Office Word or Google docs, English-proficient volunteers could enter corrections and comments into the preprint using a track change and commenting system (Figure 1). PLP functionalities could be turned on and off for submitted manuscripts. Whenever PLP is on, the manuscript receives a PLP label and is then placed in a specific section within the preprint repository, which English proficient researchers could go to and improve the English language quality. The changes that a manuscript receives become instantly visible to the original authors, who might later consider them before submission to a journal.

Benefits of peer language proofing

PLP could be revolutionary because it offers many benefits to the scientific community (Figure 2). The first direct beneficiaries of PLP would be a large proportion of the world's researchers who are not proficient in English. The latter do not typically submit their research in international journals requiring English because of the high rejection rate. Thus, PLP would not only reduce the rejection rate of non-English-speaking researchers, but also promote the submission of research from under-represented regions.

The second set of beneficiaries are all researchers who are interested in translating scientific texts in different languages. Non-native English-speaking researchers could provide PLT of the abstract and/or full texts of English-language papers in different languages. This facilitates the access of English-language papers to non-English-speaking scientists and decision-makers. Researchers with low English proficiency could also provide draft English translations of manuscripts that are written in languages other than English, which would facilitate the inclusion of multilingual studies in literature reviews and meta-analyses [6,13]. Other types of linguistic service could include performing literature searches in languages other than English, which can be fundamental for the understanding of many global processes [14].

The third beneficiaries of PLP are journals and reviewers. Despite the potential waiting time for preprints to gain PLP, it could dramatically reduce the processing time of manuscripts submitted by non-English-speaking researchers because it suppresses the time required for an editor or a reviewer to understand the scientific content of the research and make decisions based on the quality of the science.

Finally, PLP will help the scientific community in general by creating solid ties between native- and non-native English-speaking scientists for potential future collaborations [15], diversifying the scientific opinions and perspectives, and promoting equity, diversity, and inclusion in science.

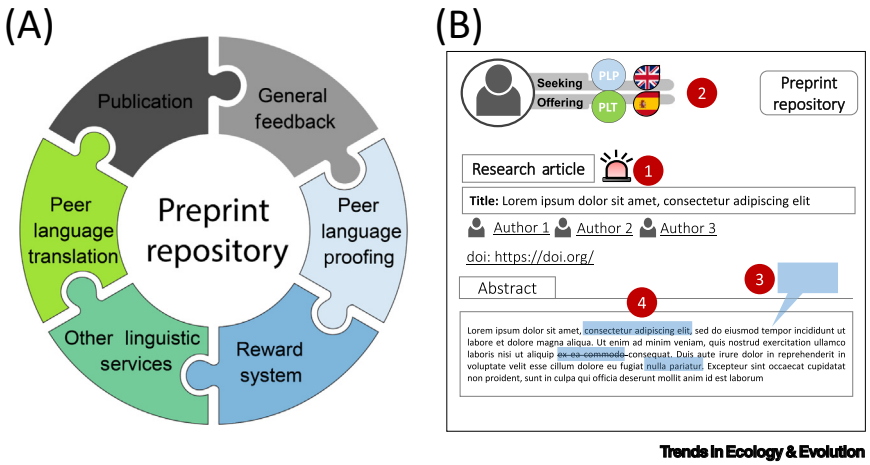

Figure 1. Integrating new functionalities into preprint repositories, including peer language proofing (PLP) and peer language translation (PLT). (A) In addition to the functionalities already present in preprint repositories, new features can be added, such as PLP, PLT, other linguistic services (literature searches in different languages), and a reward system to provide recognition to volunteers. (B) New functionalities implemented in preprint repositories: (1) The manuscript is flagged with an alert icon, highlighting that it needs a peer service (PLP or PLT); (2) Service requested and offered. Here, the authors seek English PLP and offer Spanish PLT; (3,4) e.Proofing software integrated into the preprint platform, including commenting (3) and text modification (4).

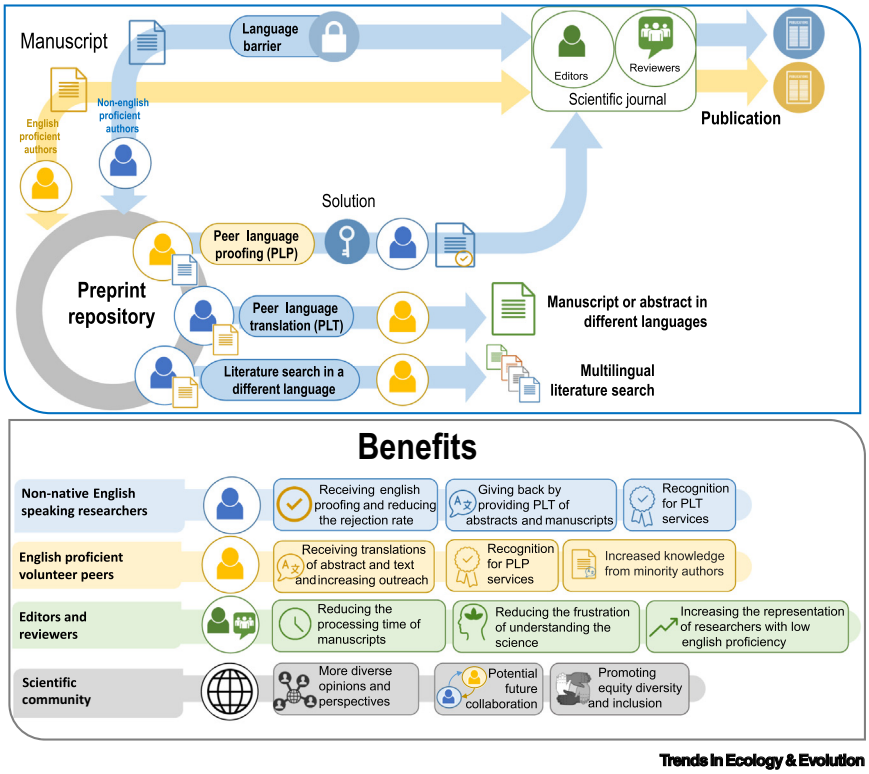

Figure 2. The process and benefits of a peer language proofing (PLP) and peer language translation (PLT) system in preprint repositories. The list of benefits provided is not exhaustive and tends to minimize the potential positive feedback of PLP and PLT for non-native English-speaking researchers, English-proficient volunteer peers, editors and reviewers, and the scientific community.

Challenges

The proposed functionalities for preprint repositories should be feasible to implement, but some challenges should be considered. Although the system offers opportunities for volunteering or exchanging linguistic skills, it mainly depends on the generosity and will of researchers to provide such services. Another issue is the quality control of the service provided or received. This is where a peer quality-check system or a recognition system that keeps track of the performance of contributors comes into play. Another challenge is that researchers might argue that the proofing and translation services should be carried out by the publishers, who make a substantial profit from the papers published. Thus, it might be challenging to introduce a sense of responsibility for performing language services despite its imminent positive impact on equity, diversity, and inclusion.

Concluding remarks

Centralizing the volunteering activity of English proofing and exchange of linguistic services in major preprint platforms will be a milestone in reaching one of the major goals of equity, diversity, and inclusion in science. It is a missing piece in the current academic system that solves two major problems, namely inequalities in publishing opportunities among countries and the unilingual scientific landscape. Thus, in addition to other proposed solutions suggested in [8], the initiative proposed here is one promising long-term solution to support scientists from developing countries who already struggle with other barriers, such as the lack of adequate funding, infrastructure, and educational opportunities [3].

Acknowledgments

We are grateful to the advisory board of bioRxiv, who expressed interest in the idea of peer language proofing and provided helpful insights. R.K. was funded by the Swiss National Science Foundation (P400PB_191139). T.A. was funded by the Australian Research Council Future Fellowship (FT180100354) and the University of Queensland strategic funding.

Declaration of interests

None declared by authors.

Resources

[i]www.biorxiv.org
[ii]www.springer.com/gp/authors-editors/journal-author/journal-author-helpdesk/e-proofing

[1]Zoology Department and Biodiversity Research Centre, University of British Columbia, Vancouver, BC V6T 1Z4, Canada
[2]Institute for Resources, Environment & Sustainability, University of British Columbia, Vancouver, BC V6T 1Z4, Canada
[3]Department of Biological Sciences, Simon Fraser University, Burnaby, BC V5A 1S6, Canada
[4]School of Biological Sciences, The University of Queensland, Brisbane, QLD 4072, Australia
[5]Centre for Biodiversity and Conservation Science, The University of Queensland, Brisbane, QLD 4072, Australia
[6]Department of Biology and Biochemistry, University of Houston, Houston, TX 77204, USA
[7]Grupo de Ecología de Invasiones, INIBIOMA, CONICET, Universidad Nacional del Comahue, Quintral 1250, San Carlos de Bariloche, CP 8400, Argentina
[8]https://rassimkhelifa.weebly.com/

*Correspondence:
rassimkhelifa@gmail.com (R. Khelifa).
@Twitter: @Rassim_KH

https://doi.org/10.1016/j.tree.2021.11.003

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