Archeologia e Calcolatori
34.1, 2023, 125-134
doi 10.19282/ac.34.1.2023.14

PEER COMMUNITY IN ARCHAEOLOGY: A COMMUNITY-DRIVEN FREE AND TRANSPARENT SYSTEM FOR PREPRINTS PEER-REVIEWING

1. Introduction

The number of scientific articles increases each year since the initiation of scientific journals, with numbers increasing exponentially from the 1980s (Fortunato *et al.* 2018; Fire, Guestrin 2019; Bornmann, Haunschild, Mutz 2021). The current system of scientific publication, mainly managed by a few for-profit publishers that comprise most of the journals worldwide (Larivière, Haustein, Mongeon 2015), has become very costly for our public institutions of research, both financially (Van Noorden 2013; Bosch, Albee, Romaine 2019; Björk 2021; Grossmann, Brembs 2021) and in the time dedicated freely by researchers for peer-review (Kovanis *et al.* 2016; Aczel, Szaszi, Holcombe 2021). This traditional model of publishing in these for-profit journals, limiting dissemination behind paywalls or high publication fees (Siler, Frenken 2019; Kwon 2022), is increasingly being criticised (Tennant 2020; Brembs *et al.* 2021).

As a response to these serious flaws of the academic publication system, academics are increasingly arguing for the adoption of a free publishing process, both for authors and readers, called Diamond (or Platinum) Open Access (Becerril *et al.* 2021; Bosman *et al.* 2021; Pearce 2022). As part of this push for open and freely accessible research, the deposit of preprints in open archives is becoming the norm (Vale 2015; Kaiser 2017; Hettne *et al.* 2021). However, the quality of these preprints must be guaranteed for quality assurance in research (Gunnarsdóttir 2005; Vale 2015; Kaiser 2017) and this is where Peer Community In provides a solution.

2. Peer Community In

2.1 *Presentation*

In 2016, Peer Community In (PCI), a not-for-profit and non-commercial organization, was created by three French researchers, Denis Bourguet, Benoit Facon, and Thomas Guillemaud, to enable communities of researchers to assess the quality of the work deposited in open archives and thus ensure broad dissemination of high-quality Science (Guillemaud, Facon, Bourguet 2019). After the launch of the pioneering PCI Evolutionary Biology in 2017, PCI Ecology and PCI Paleontology followed in 2018. The organisation presently has 16 different communities in total, including PCI Archaeology which was launched in 2020.

PCI offers an innovative way to evaluate scientific results that are free for authors and readers. The system is based on open peer-review (Ross-Hellauer 2017) and also promotes non-anonymized review – although reviewers can decide to remain anonymous – these two modalities improving transparency, accountability, and constructive criticism (Ross-Hellauer 2017; Besançon *et al.* 2020; Bolek *et al.* 2020; Le Sueur *et al.* 2020). PCI also makes the deposit of all necessary datasets mandatory prior to the recommendation of any preprint and provides the possibility of pre-registration and even registered reports (Chambers 2013; Nosek *et al.* 2018; Ross, Ballsun-Stanton 2021) in a dedicated community created in 2021 to favor reproducibility in scientific research (Munafò *et al.* 2017; Chambers, Tzavella 2022).

This initiative is supported by many institutions including the French Ministry of Research, research organisations like the Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement (INRAE) and the Centre National de la Recherche Scientifique (CNRS), dozens of universities both in France and abroad, learned societies and doctoral schools (see the list at https://peercommunityin.org/pci-network/). It is funded by these institutions and a grant awarded by the French Fond National pour la Science Ouverte (FNSO). In 2020, the PCI initiative was awarded a prize for Library Innovation by the European network of research libraries (LIBER).

2.2 *Process*

The process leading to a potential recommendation by any PCI is the same (Fig. 1), except for PCI Registered Reports that have a specific workflow. First, authors deposit their data, code, and preprint on the archiving repository of their choice, one that provides a persistent identifier, mainly DOI. PCI does not maintain any such repository, and preprints can be uploaded to any preprint server, like Zenodo, BioRxiv, OSF Preprints, etc. The second step is for authors to submit their work to the PCI dedicated to their discipline, where they can suggest recommenders among the community. The submission is validated by the managing board, which can also add other suggested recommenders, after an initial check is made on the preprint, the availability of data, code, etc. If a recommender is interested in handling the editorial process over this preprint, they will invite reviewers and handle the complete editorial process as an associate editor in a traditional journal would do. To share the workload and editorial power among recommenders, and to ensure the specialisation of the recommender, every PCI is encouraged to create a pool of recommenders.

At the end of the process, if the manuscript is recommended, the recommender writes a recommendation of the preprint explaining why this manuscript is interesting for the community, and all the editorial process (reviews, answers to reviews, intermediate decisions) is published openly following this text. This recommendation is the publication of PCI and highlights the

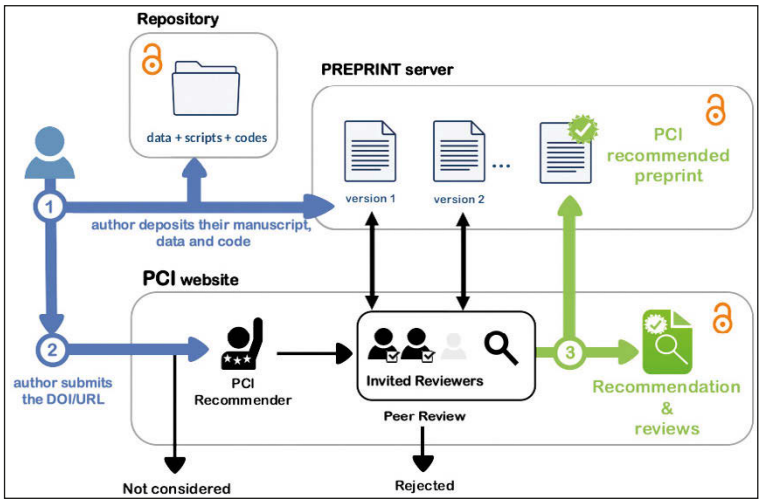

Fig. 1 – Process of submission and evaluation by Peer Community In.

recommender's work. After this recommendation, authors are invited to upload a final version of the preprint on the preprint server using the PCI template. If the manuscript is rejected, at any step of the process, the reviews, answers to reviews, and editorial decisions, are not made public.

This manuscript is still a preprint, even if peer-reviewed and recommended, and can therefore be submitted to a traditional journal if desired or necessary for authors. Most journals accept submission of preprints, and some journals are specifically PCI Friendly. PCI Friendly journals are those who state that they accept submissions of recommended preprints, and can fall in different categories: journals that automatically accept a recommended preprint and publish it without any further peer-review; journals that will give a quick answer to authors as to whether or not the manuscript will go through a new round of peer-review; and journals that accept the peer-review of PCI if they evaluate it as appropriate. Of course, any other journal will have the opportunity to access the reviews to make its own editorial process.

3. Peer Community In Archaeology

3.1 *Presentation*

Open Science and reproducibility is a topic of current interest for archaeological research (Marwick *et al.* 2017; Karoune, Plomp 2022). Despite the absence of dedicated preprint servers for the topic, and a feebly developed practice of preprints in the community so far, PCI Archaeology was launched

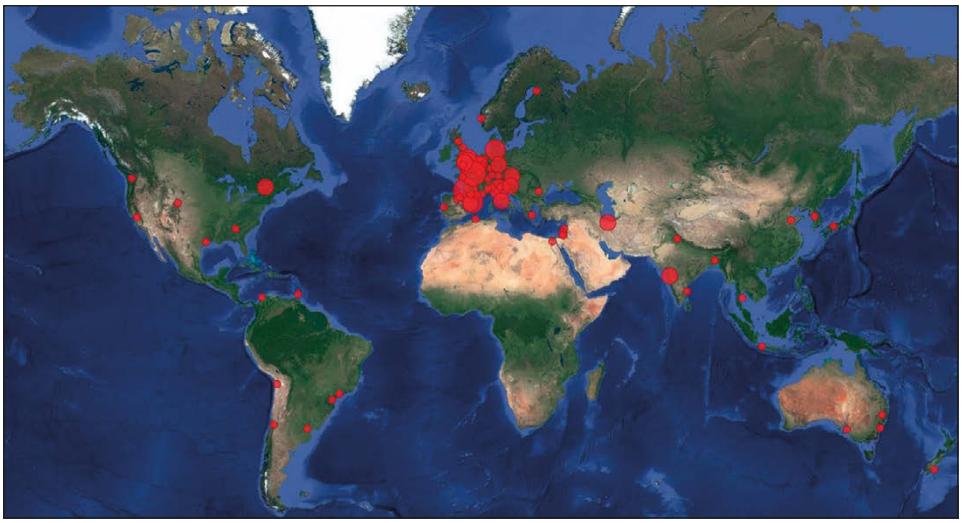

Fig. 2 – Geographic repartition of the recommenders of PCI Archaeology.

in March 2020. More than 100 archaeologists from around the world (Fig. 2) gathered to act as recommenders, covering all fields of the discipline (Fig. 3A, B, and D) ranging from Early Career to Senior researchers in the field (Fig. 3C). Although we have recommenders from many parts of the world, we still have work to do in ensuring a larger representation of recommenders from Global South countries.

3.2 *PCI Archaeology in numbers*

From the launch of PCI Archaeology until March 2023, 45 preprints have been submitted for free and transparent peer-review, mostly for Prehistoric periods, and from authors located in Europe, South and North America, Asia, and the Middle East. These preprints were archived by authors mainly in the OSF framework (the generalist OSF Preprints, SocArXiv, EcoEvoArXiv, PaleoArXiv), in Zenodo, BioRxiv, and other servers (Fig. 5). Among these 45 submissions, 43 were taken care of by recommender(s) and sent for peer-review and 2 were desk-rejected (#11 and #23). Among the 43 manuscripts considered for evaluation, 23 were recommended, 6 were rejected or cancelled by authors, and 14 are still in the process of peer review. Finding suitable reviewers for each manuscript has been extremely variable, ranging from sending three to thirty-two invitations to secure at least two reviewers for each manuscript (Fig. 5). Among the 112 reviewers who evaluated the preprints, only 23% decided to remain anonymous. The first round of peer-review took a mean length of

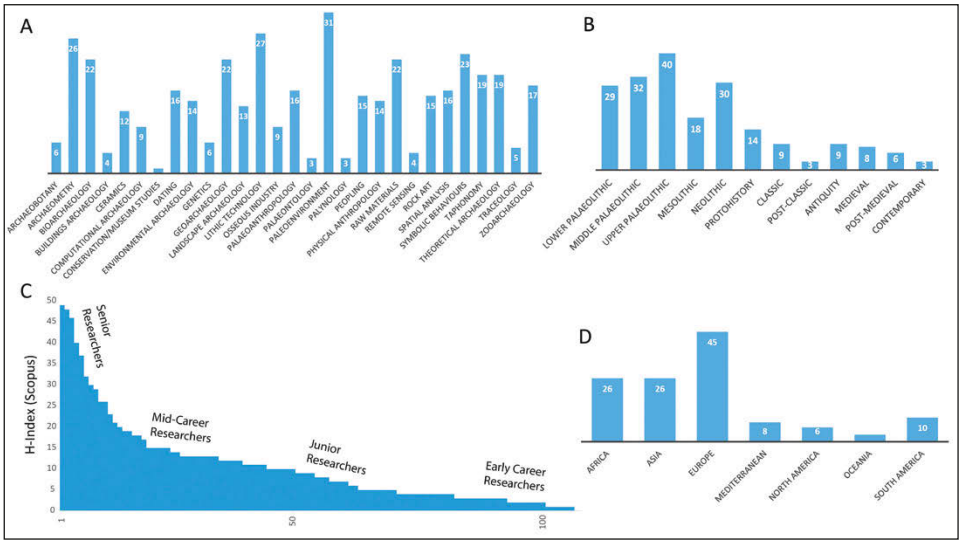

Fig. 3 – PCI Archaeology recommender's thematic (A), chronological (B), and geographical fields of expertise (D). Scopus H-indices used as a proxy of research experience of recommender (C).

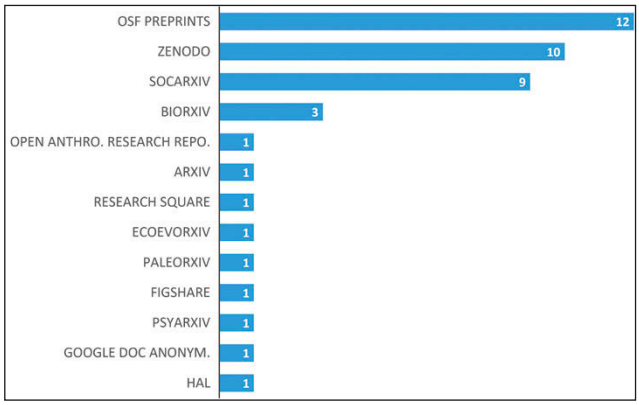

Fig. 4 – Preprint servers used so far for the submissions to PCI Archaeology.

46 days and, including the delay between submission and the invitation of reviewers, and the delay between the last review and the editorial decision, the mean length between submission and the first decision was 52 days.

After the recommendation of the manuscript, most authors decided to submit their work to a journal (Tab. 1). The Peer Community Journal is

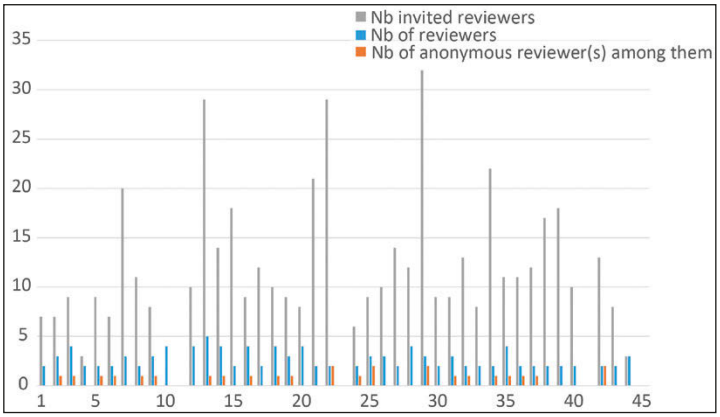

Fig. 5 – Number of reviewers invited, secured, and those who chose to remain anonymous for each submitted preprint.

Journal	Published as is	Supplementary peer-review
Peer Community Journal	11	
PLOS ONE	1	1
Anthropologica et Praehistorica	1	
Journal of Archaeological Method and Theory		1
Journal of Archaeological Science		1
Journal of Lithic Studies	1	
Journal of Open Arch. Data	1	
Quaternary International		1
Quaternary Science Reviews		1

Tab. 1 – Fate of recommended preprints in journals, whether accepted as is by journals' editors, or sent for a supplementary round of peer-review.

a Diamond Open Acces journal created in 2021. This journal accepts any preprint that has been recommended through any PCI without the need for further peer-review. Authors selected the journal based on the content of their manuscript and the scope of the journal, of course, and some of them endured a supplementary round of peer-review. Journals' editors made this decision based on the reviews published and their knowledge of PCI Archaeology.

4. Conclusion

The process of open and free peer-reviewing of preprints through PCI Archaeology introduced in 2020 has been mostly successful. We have attracted more than 100 researchers to act as recommenders and received 45 submissions so far. Although we would be delighted to receive more submissions,

we think the use of preprints by archaeologists is still perceived as an atypical publishing strategy in our community. Our data shows that reviewers consider the open process positively although it has been difficult for some manuscripts to secure two reviewers. Reviewers are aware that their free labour will be used here for free open access, instead of providing value to for-profit journals. We consider that good science should be free, peer-reviewed, reproducible, and open access, and that PCI Archaeology offers all those factors. We hope that archaeologists will, in the future, submit their work to our community, accept invited review, endorse the process by citing and considering valuable the recommended preprints as well as spread the word about our initiative.

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ABSTRACT

The number of scientific articles published each year is on the rise, but the current system, which is dominated by a few for-profit publishers, has become prohibitively expensive for many institutions. This model of publishing is increasingly being criticized for its serious flaws. The deposit of preprints in open archives is a solution for the rapid dissemination of research. However, the quality of these preprints must be ensured. This is where Peer Community In (PCI) comes in, by organizing communities of researchers to assess the quality of the work

deposited in open archives. In 2020, a PCI dedicated to Archaeology was established, with over 100 archaeologists acting as recommenders. These recommenders handle the submitted preprints as associate editors would in traditional journals, but at the end of the process, they write a recommendation text, and the entire editorial process is published with it. So far, PCI Archaeology has received 45 submissions, mostly pertaining to Prehistoric periods, and from authors located in different regions of the world. This open process has been widely accepted by reviewers, but there is still a need to promote the use of preprints in the community of archaeologists.