Reforming the scientific publishing system

Open Access – Open Evaluation (OA) (OE)

Nikolaus Kriegeskorte
MRC Cognition and Brain Sciences Unit
Cambridge, UK
The four pillars of open science

An open review of Gorgolewski & Poldrack (PP2016)

- transparent
- usable by others
- efficient communication
- improved community checking
- better community cognition
- faster scientific progress
I want open access!

OK!

I’m cold! Where is my wool?

open access fee

subscription fee

page charges
A publication system needs to provide two functions

(1) access to papers

open access (OA)

(2) evaluation of papers

open evaluation (OE)
Open access (OA)

“Gold”

gold for the publishing industry

Unnecessarily expensive.

“Green”

just put it on the web

Yes, but need guaranteed permanent accessibility and citability!

Harnad 1994
Digital object identifier (DOI)
Digital object identifier (DOI)

Getting a DOI and permanent archiving...

- figshare (free)
- The Winnower (small charge)
Now I am become DOI, destroyer of gatekeeping worlds

Tal Yarkoni

Digital object identifiers (DOIs) are much sought-after commodities in the world of academic publishing. If you’ve never seen one, a DOI is a unique string associated with a particular digital object (most commonly a publication of some kind) that lets the internet know where to find the stuff you’ve written. For example, say you want to know where you can get a hold of an article titled, oh, say, Designing next-generation platforms for evaluating scientific output: what scientists can learn from the social web. In the real world, you’d probably go to Google, type that title in, and within three or four clicks, you’d arrive at the document you’re looking for. As it turns out, the world of formal resource location is fairly similar to the real world, except that instead of using Google, you go to a website called dx.DOI.org, and then you plug in the string ‘10.3389/fncom.2012.00072’, which is the DOI associated with the aforementioned article. And then, poof, you’re automatically linked directly to the original document, upon which you can gaze in great awe for as long as you feel comfortable.

Historically, DOIs have almost exclusively been issued by official-type publishers: Elsevier, Wiley, PLoS and such. Consequently, DOIs have had a reputation as a minor badge of distinction—probably because you’d traditionally only get one if your work was perceived to be important enough for publication in a journal that was (at least nominally) peer-reviewed. And perhaps because of this tendency to view the presence of a DOIs as something like an implicit seal of approval from the Great Sky Guild of Academic Publishing, many journals impose official or semi-official rules that say that all papers that appear in a journal have to have a DOI. And that’s why you see so many DOIs in academic papers, and why you might be surprised to find one at the end of a blog post, or even a magazine article.
Digital object identifier (DOI)

Getting a DOI and permanent archiving...

- figshare (free)
- The Winnower (small charge)
- ...
- preprint servers
OA with DOI: preprint servers
The selfish scientist’s guide to preprint posting

Nikolaus Kriegeskorte

Preprint posting is the right thing to do for science and society. It enables us to share our results earlier, speeding up the pace of science. It also enables us to catch errors earlier, minimising the risk of alerting the world to our findings (through a high-impact publication) before the science is solid. Importantly, preprints ensure long-term open access to our results for scientists and for the public. Preprints can be rapidly posted for free on arXiv and bioRxiv, enabling instant open access.

Confusingly for any newcomer to science who is familiar with the internet, scientific journals don’t provide open access to papers in general. They restrict access with paywalls and only really publish (in the sense of make publicly available) a subset of papers. The cost of access is so high that even institutions like Harvard and the UK’s Medical Research Council (MRC) cannot afford paying for general access to all the relevant scientific literature. For example, as MRC employees, members of my lab do not have access to the Journal of Neuroscience, because our MRC Unit, the Cognition and Brain Sciences Unit in Cambridge, cannot afford to subscribe to it. The University of Cambridge pays more than one million pounds in annual subscription fees to Elsevier alone, a single major publishing company, as do several other UK universities. Researchers who are not at well-funded institutions in rich countries are severely restricted in their access to the literature and cannot fully participate in science under the present system.

Journals administer peer review and provide pretty layouts and in some cases editing services.
Costs & benefits of preprint posting

as a function of time of posting

Kriegeskorte 2016
Are we *allowed* to post preprints and still publish with normal journals?

- All major journals support preprint posting.
  - Nature
  - Science
  - Nature Neuroscience
  - almost all specialised journals

- Check your target journal’s policy at *Sherpa* website (University of Nottingham), which has the definite list of each journal’s policies.
Posting preprints

advantages
• instant and permanent OA
• DOI
• preprint precedence
• early citation

disadvantages
[none discovered yet]
Open evaluation (OE)

post-publication, evaluative responses from peers

- peer reviews
- peer ratings

→ explicit judgments
  (in contrast to article metrics like views, downloads, etc.)

→ signed or anonymous
Evaluation is the steering mechanism of science

- steers the attention of scientists
- steers the direction of each field
- steers the progress of science
- steers public use of scientific results

Designing the collective cognitive process of the scientific community!
Future

Research, writing → instantly published paper → open peer review and reception (merged process) → citing paper

Rating rating rating → review review review → rating rating rating

Time: 0 months → 3 months → 1-10 years

Kriegeskorte 2012
pre-publication review

- publication delayed
- review process closed

- evaluation compromised
  - limited to chosen reviewers
  - no public scrutiny

post-publication review

- publication instant
- review process open and transparent

- evaluation reflects the field’s deepest wisdom
  - broader and deeper
  - all arguments heard
  - all arguments under public scrutiny
The nature of a review

Current
• secret communication to authors and editors
• decides about publication
• reviewer’s motivation
  – selfless: scientific objectivity
  – selfish: science politics
• a weak argument can make or break a paper

Future
• open letter to the community
• evaluates published work
• reviewer’s motivation
  – selfless: scientific objectivity
  – selfish: looking smart and objective in public
• an argument is as powerful as it is compelling
**peer-to-peer editing**
- authors ask a senior scientist to edit the paper
- editor chooses 3 reviewers and asks them to openly review the paper
- editor is named on the paper

---

**published, author authenticated, unreviewed paper**

---

**published, author authenticated, reviews**

(sign signed or unsigned)
review
• text
• numerical ratings
  • justification of claims
  • importance
  • originality
  • …

peer-to-peer editing
• authors ask a senior scientist to edit the paper
• editor chooses 3 reviewers and asks them to openly review the paper
• editor is named on the paper

published, author authenticated, reviewed paper
paper evaluation function (PEF)
- arbitrary function that scores papers based on the available meta-information
- simplest case: weighted average of review ratings
- individuals or groups can define PEFs to prioritize the literature according to their needs

paper score: 86 %ile
paper score: 98 %ile

ready to be showcased in Science or Nature
Consensus points of 18 visions for OE

- The evaluation process will be totally transparent.
- Anyone can define a formula for prioritizing papers, fostering a plurality of evaluative perspectives.
- The system heavily relies on signed evaluations.
- Reviews and reviewers are meta-evaluated.
- The open evaluation process is perpetually ongoing, such that promising papers are more deeply evaluated.
- Formal statistical inference is a key component of the evaluation process.

Kriegeskorte et al. 2012 (Editorial summary of Frontiers Ebook on Open Evaluation)
Until we have the perfect platform...

• use blogs
• use social media

Create the culture of publishing you would like to see!
What I do

OA
• post all our work on open-access preprint servers
• read and cite papers on preprint servers

OE
• sign my reviews (all, including those leading to rejection of the paper)
• publish all my reviews on a blog as soon as I write them (I only review papers that are published as preprints!)
• write reviews as letters to the community
• title all reviews with the title the paper should have (TPSH)
• tweet with ratings about papers