

Scientists: support a self-archiving mandate to free the peer-reviewed journal literature

Geert Kapteijns^{*}

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Universal free online access of scientific journal articles is within reach if universities and funders mandate their authors to self-archive their refereed manuscripts in an institutional archive (IR), upon acceptance in the (subscription) journals of their choice. This form of open access (OA), known as *Green*, can be implemented unilaterally by the universities and funders at little cost. It should not be confused with *Gold* OA, meaning OA through *publishing* directly in an OA journal.

I claim that the Dutch government and the association of universities (VSNU), by focussing on Gold prematurely, have made deals that will needlessly slow down the provision of access and maintain or even increase the publishers' profit margins. Sustainable Gold access (including copyright and re-use rights reform) plausibly follows once universal Green has been reached and publishers only provide the organisation of peer-review and luxury services like enhanced PDFs and paper versions.

Change must be effected by institutions and funders, but they have to be persuaded by scientists to install the optimal self-archiving mandate. Grassroots publishing initiatives, such as SciPost in physics, politicize the community by offering a glimpse of a possible future. In order to speed up the transition to a fair publishing industry, they should, in addition to their innovative activities, put their full weight behind Green.

I. Introduction

The current accessibility of research journal articles is decidedly suboptimal. Journal prices have been rising at 2.5 times the rate of inflation the last couple of decades [1, 2], but even if all 28000 existing journals could be subscribed to at production cost, universities would not be able to afford them all [3]. No researchers, not even those at the richest institutions, have full access to the output of their colleagues, and all researchers are denied

the full impact of their research, since they cannot reach the entirety of their intended audience.

It is unbearable that this *access/impact problem* still persists, because with the advent of the Web, articles can be reproduced and spread at virtually no cost. Doubly unbearable, since the whole enterprise is funded with tax-payer money for the benefit of society.

The solution to the problem is, according to Stevan Harnad, closer to raincoat science than rocket science (see Figure 1). In a haiku [4]:

^{*} ghkapteijns@gmail.com



Figure 1: Raincoat science by Judith Economos [8].

It's the online age
You're losing research impact...
Make it free online

In other words, authors can continue publishing in subscription journals, but should as an extra administrative step *publicly self-archive* their refereed manuscripts. This practice, which Harnad has been advocating since 1994 [5], was laid out by the Budapest Open Access Initiative (BOAI) as the first strategy to be implemented [6]. It later came to be known as the *Green* strategy [7]. If it is universally adopted, the access/impact problem would be solved.

Apart from public self-archiving (the “Green” road), the BOAI described a complimentary *Gold* strategy, namely to start a new generation of journals that provide open access to the material they publish. It is this second strategy that often has been misunderstood to be the *only* viable strategy of providing open access, by scientists, media and politicians alike.

This is very unfortunate, since the Green solution is by far the most cost-effective way of providing access [9] (10%-20% of what it presently costs to pay for Gold), can be decided on by universities and funders unilaterally, without having to

convince publishers to alter their business model, and does not limit authors’ choices of journals in which they wish to publish.

Furthermore, it is plausible that once universal Green open access has been achieved, existing subscription journals will face significant cancellation pressure, because all their content is already available as self-archived manuscripts. Publishers would be forced to cut costs and change their business model, since the services they provide have been reduced to organizing peer-review and providing enhanced PDFs and paper versions of the articles. Thus, Green OA will leverage the transition to universal Gold [10].

In the rest of this article, I will first outline what is currently understood to be the optimal Green open access policy. Then, I will show that official policy in The Netherlands seriously deviates from this consensus, needlessly slowing down the provision of access and maintaining or even increasing the publishers’ profit margins. Finally, I describe that, since change is most likely to come from below, it is of vital importance to the community that grassroots initiatives embrace the Green mandate.

II. The optimal Green mandate

Apart from being beneficial to the community, self-archiving is also advantageous for researchers personally due to increased uptake and citation impact of their work [11].

Yet, the majority of scientists do not self-archive voluntarily. 62% of journals endorse self-archiving immediately and an additional 17% endorse self-archiving after an embargo period of six months or a year [12]. But estimates for the actual percentage of articles that is accessible in this way (be it from an institutional archive, a preprint server or the author’s homepage) are far lower. The authors of [13] find that in 2009 20% of all journal articles were openly accessible, of which 12% through self-archiving. In a subse-

quent study, the same authors find an unchanged 12% Green in 2014 [12]. The authors of [14] find 24% total OA (Green and Gold) in 2013. The study in [15] is an outlier, finding 48% total OA, of which 34% Green¹, already in 2008.

These numbers include unrefereed preprint versions (about 15% in [12]), since the archived and published versions are mostly matched by automated title/author/abstract matching. Furthermore, archived manuscripts are scattered throughout the Web [16], and archived versions that became available only after a (possibly long) embargo period are counted.

In the domain of Physics and Astronomy, where sharing preprints has historically played an important role [17], self-archiving is universally endorsed by publishers². The preprint server arXiv, established in 1991, has become the canonical place to share manuscripts. But even in this field, self-archiving is not systematic, although the numbers are slightly higher. Estimates are that around 20% of papers that appear in Web of Science journals can be found on arXiv, possibly as an unrefereed (preprint) version [13, 19]. Some subfields, such as astronomy and high-energy physics, have around 70% Green with the percentage in top journals approaching 100% [20].

If the benefits are clear, why do scientists refuse to self-archive? Harnad lists many possible reasons [21], the most prevalent being that (i) scientists think it is illegal, (ii) that it causes their papers to be less likely to be accepted, and (iii) that

scientists are simply too lazy.

The solution is for universities and funders to *mandate* their researchers to self-archive. It is worth quoting Harnad's implementation proposal in full [22]:

- (1) All research funding agency OA Mandates need to specify clearly and explicitly that the deposit of each article must be in the author's institutional repository (so the universities and research institutions can monitor their own output and ensure compliance as well as adopt mandates of their own for their unfunded research output).
- (2) All mandates should specify that the deposit (of the authors refereed, revised, accepted final draft) must be done immediately upon acceptance for publication (not on the date of publication, which is often much later, variable, not known to the author, and frequently does not even correspond to the journal issue's published date of publication, if there is one).
- (3) All mandates should urge (but not require) authors to make their immediate-deposit immediately-OA.
- (4) All mandates should urge (but not require) authors to reserve the right to make their papers immediately-OA (and other re-use rights) in their contracts with their publishers (as in the Harvard-style mandates).
- (5) All mandates should shorten (or, better, not even mention) allowable OA embargoes (so as not to encourage publishers to adopt them).
- (6) All repositories should implement the automated "email eprint request" Button (for embargoed [non-OA] deposits).
- (7) All mandates should designate repository deposit as the sole mechanism for submitting publications for performance review, research assessment, grant application, or grant renewal.
- (8) All repositories should implement rich usage and citation metrics in the institutional repositories as incentive for compliance.

A few of the points are worth stressing. Articles accepted in the 38% [12] of journals that impose embargoes on self-archiving or do not allow it at all should still be deposited (point 3).

¹The authors also include articles published in *hybrid* journals – meaning subscription journals that offer the option of providing open access for an additional author fee – in this percentage, so the fraction of Green articles is presumably slightly lower.

²This is an example of "proof by intimidation." Feel free to prove me wrong using [18]. In any case, physicists, along with computer scientists and mathematicians, have always freely shared their preprints and refereed manuscripts. E-mail and later preprint servers became natural tools to make this practice easier and were freely used, even before the issue of self-archiving ended up in publisher contracts [17]. Publishers have, to the best of my knowledge, never ordered anyone to take down a manuscript in these fields.

The institutional repository should implement an “email eprint request” or “fair dealing” button [23] (point 6) that allows prospective readers of these deposited non-OA articles to request an individual copy with a single click, which the author can acknowledge with another single click. This is completely legal, except under almost inconceivable circumstances, since the articles are shared for the purpose of “study, criticism, and news reporting.”³ The institutional repository merely facilitates the age-old scientific practice of handing out personal-use copies to interested colleagues, thus providing “almost-OA.”

Equally important is what is *not* in the mandate. Harnad:

[It is essential] not to insist prematurely on further rights – over and above free online access – that publishers are not yet willing to allow, such as text-mining, re-mix and re-publication rights. First things first: Funders, institutions and authors should not prolong their failure to grasp what’s already within their reach by over-reaching for what’s not yet within reach: The perfect should not be allowed to become the enemy of the good.

An optimal self-archiving mandate, if universally adopted by universities and institutions, solves the access/impact problem without forcing publishers to change their business model, without limiting authors in their choice of journals and at low cost. Once the access and archiving of research output is firmly controlled by the community and the role of publishers is reduced to organising peer-review and offering luxury products, publishers will have lost their bargaining power over copyright, which will soon follow.

³The unconvinced reader may read section “Legal and policy considerations” from [23] or consult her local legislation.

III. Current policy in the Netherlands: Fool’s Gold

The current official policy in the Netherlands is about as far from the optimal solution as one can get. The Dutch secretary of Education, Culture and Science Sander Dekker, following the Finch report [24] before him, outlined the government’s stance in his letter to the House of Representatives [25] in 2013 (citations from English translation [26]):

My preference is “golden” open access; [...] The universities, the Royal Academy and NWO [Dutch governmental organisation for scientific research] will have to prioritise the golden road to open access in their institutional policies [...] Publications will be made publicly available in open access journals. Until the publishers have switched to the golden road to open access, I prefer a system of hybrid journals in which institutions pay to have papers published open access in subscription-based journals. Those disciplines in which there are few opportunities to publish in open access journals can opt for the green road to open access, in other words by having authors self-archive their articles in a repository.

The letter urges universities and funding organisations to encourage their authors to publish directly in OA journals. Self-archiving is seen as a final resort for disciplines in which those journals are not (yet) available. Embargoes on self-archiving are presented as laws of nature, fundamental rights of publishers and the possibility of a “fair use button” is not mentioned. Dekker threatened to mandate the Gold strategy by law if deals between publishers and universities did not follow fast enough:

If the relevant parties do not do enough, or progress is unacceptably slow, the Min-

ister and I will recommend making open access publication mandatory in 2016 under the Higher Education and Research Act (Wet op het hoger onderwijs en wetenschappelijk onderzoek, WHW).

And indeed, the very timid VSNU (Vereniging van Samenwerkende Nederlandse Universiteiten or the association of Dutch universities) made deals with all major publishers in the years that followed [27], concluding in their self-congratulatory report [28] that “The Netherlands became a guiding country for open access” by “using Big Deals as a crowbar,” while designating Green as unsustainable.

The deals [29] only provide 20% - 30% open access in the short-term, mostly in existing subscription journals, paid for by the Dutch universities (who also still have to pay subscription fees for incoming content). They allow publishers to keep charging extravagant prices for services that could be in the hands of research community, while smoothly transitioning into the “author processing fees” business model. Moreover, the deals do not scale and are unstable [30]. Harnad:

The notion of a “flip” to fool’s gold is incoherent – an “evolutionary unstable strategy,” bound to undo itself: not only because it requires self-sacrificial double-payment locally as well as unrealistic collaboration among nations, institutions, funders, fields and publishers globally, but because the day after it was miraculously (and hypothetically) attained globally it would immediately invite defection (from nations, institutions, funders, and fields) to save money (invasion by the “cheater strategy”). Subscriptions and gold OA “memberships” are simply incommensurable, let alone transformable from one into the other. (Memberships are absurd, and only sell – a bit, locally – while subscriptions still prevail, via local Big Deals.)

Although every university is equipped with a repository [31] and the universities, libraries and funding organisations are in favor of Green (see [32] – TU Eindhoven even has a mandate that is reasonably good), the Dutch government and VSNU have bought “Fool’s Gold,” showing themselves to be firmly on the side of publishers. In an opinion piece directed at his international colleagues, called “For Europe’s Fifth Freedom”, Sander Dekker drops all pretense that he is not a corporate avatar [33]:

Europe has the world’s largest internal market, seeking to guarantee the free movement of goods, capital, services and people [...] [that have lain] fertile ground for decades of peace and prosperity. [GK: for whom?] [...] Ministers in Europe concerned with science and innovation should thus bring a ‘fifth freedom’ into play: the free movement of knowledge and data. [...] In the corporate world, data is increasingly supplanting oil as the main economic asset. But the research data from our smartest people too often lies gathering dust on easily-misplaced USB sticks. The central storage of data and tools to consult and re-use it, are often lacking. In an era when big data technology and services are expected to grow at a compound annual rate of 40 per cent, this is nothing less than full-blown capital destruction.

No surprise that also the “Amsterdam Call for Action on Open Science” [34] produced by the Dutch Presidency of the Council of the European Union heavily emphasizes Open Data. Open Data, re-use rights or author copyright is premature if there is not even Open Access, and divert scientists from their most important immediate goal: providing free access to their own output through self-archiving.

IV. A grassroots movement

The path that the government has taken is clear (and given the next imminent right-wing government, not likely to change). The change has to be made on the level of universities and funders, who must install the right mandate. It is up to scientists to convince them to do so.

Grassroots open access publishing initiatives (like SciPost [35] in physics) play a large role in politicizing the community: they spread the message that not only open access, but complete author copyright and peer-review reform are possible and can be provided at a fraction of the current cost. But if they are serious about their goals of breaking the dominance of the publishing industry, they should consider how to best proceed from the current situation.

The empirical studies cited in this article are clear. Scientist right now do not care too much for open access. If they did, they would just make their works available online (at the very least the ones they legally could). It is not realistic to expect that the same scientists can be persuaded to publish en masse in new fair-Gold journals, while they could also publish in the current top journals in their field. In fact, scientist-run refereed open access journals with peer-witnessed commentaries have been around since 1990 [36] and they have not replaced the corporate publishers' journals.

It is thus vital that the grassroots journals of the current generation use the positive attention they receive to make clear to universities and funders that *they* can free the journal literature by mandating their researchers to self-archive. Once this mandate spreads among institutions and funders worldwide, the cancellation pressure on the existing journals will leverage the transition to a stable fair-Gold system.

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