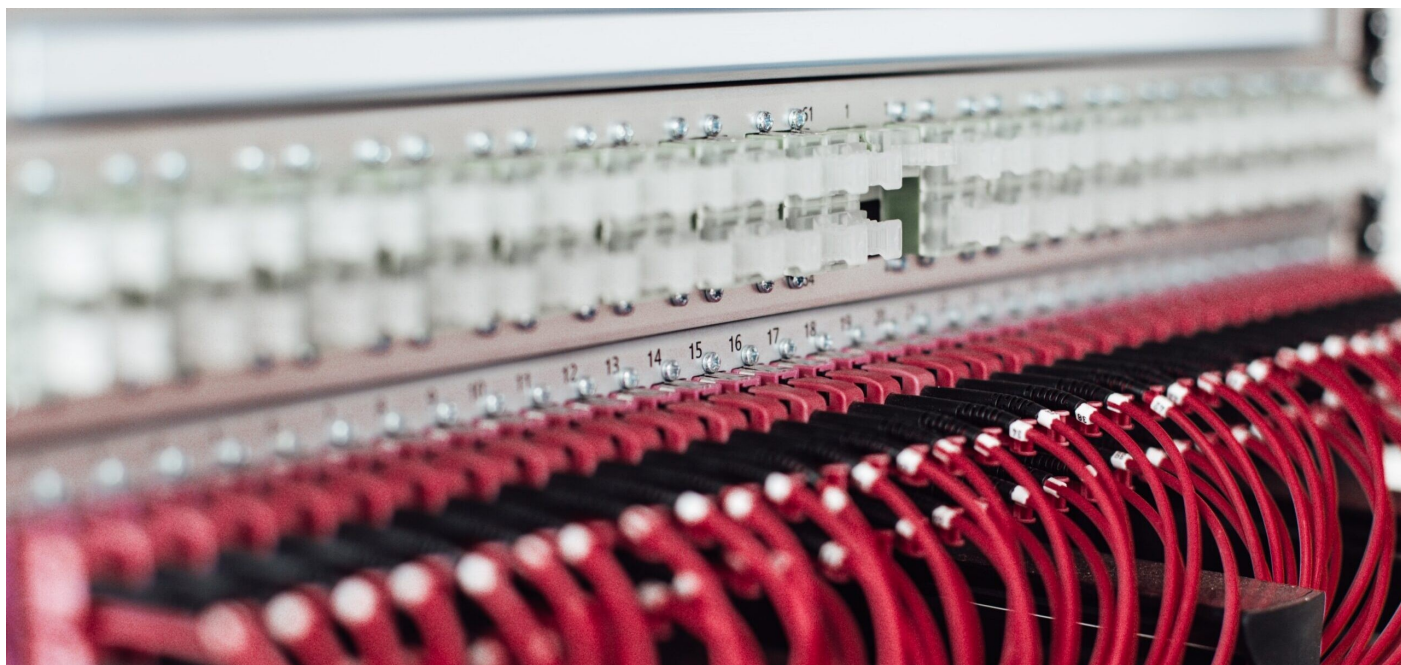


The Digital Threat to Science and Academic Freedom

Editorial Board :



By Raffaella Kunz



Portrait of Raffaella Kunz.

Photo: private.

The academic publishing system is in full transformation – but not in the way many had hoped for. Since the arrival of the Internet, it was predicted that the way knowledge is accessed and disseminated would undergo a fundamental change. The unprecedented communicative potential of the Internet was often considered highly beneficial for science. “An old tradition and a new technology have converged to make possible an unprecedented public good...”, so the enthusiastic opening of the 2002 [Budapest Open Access Initiative](#). The possibility to publish research digitally and at low cost, making it available to everyone around the globe who has an Internet connection, seemed to offer unmatched potential to advance science – and almost inevitably to put an end to traditional print publishing.

Today, exactly 20 years after the Budapest statement, the ‘[access revolution](#)’ is still not concluded, but the Corona pandemic has given the Open Science movement a new boost (see, e.g., this [joint appeal](#) by CERN, OHCR, UNESCO, and the WHO), and Open Access plays a greater role in the portfolios of publishers. Yet, this process has been much less trailblazing and indeed less ‘revolutionary’ than expected. Most of all, it is becoming increasingly clear that the digital era does not mean the end of commercial academic publishers. Rather, the big publishing companies seem to be finding ways to adapt their business models to the new digital environment – and to become even more relevant and powerful than ever.

It is well known that academic publishers quite successfully undertook an ‘[economic re-interpretation](#)’ of Open Access by charging authors for publishing their works, rather than readers for accessing content (“Article processing charges”). Now reports increasingly bring to light the extent to which academic publishers have started to use the tools developed by ‘pioneers’ such as Google and Facebook to track scientists and users more broadly in order to collect their data (see, e.g., this informative [briefing paper](#) under the umbrella of the DFG, the German Research Founding Organization). In other words, science has been discovered as a new field for the data analytics business, or as aptly pointed out [elsewhere](#), “(...) the previous special milieu of science communication has been incorporated into the general commercial (and governmental) surveillance of the digital space”.

While this might not come as a big surprise – it is, after all, well known by now that every step taken on the Internet is tracked and monetized – the consequences this potentially has for the science system are far-reaching. Besides raising obvious questions about privacy, this development also constitutes a threat to academic freedom. Importantly, it not only concerns the freedom of individual researchers, but also has a systemic dimension and possible consequences for the science system as a whole.

On the way to an entirely commercial science infrastructure?

But what exactly is being tracked, and why? The aforementioned [DFG paper](#) provides a good overview of the data-mining methods and tools used, such as page-visit trackers, audience tools, and fingerprinters. The goal is to aggregate and reuse or resell user traces. According to the DFG briefing paper (p. 6), the gathered data offer insights into entire research cycles. They are thus of economic value and a potential source of revenue when selling them to third parties. These parties are primarily private actors, but especially in the US, reports have revealed that data are also being sold to [law enforcement authorities](#).

On the one hand, publishers use the data-based information to expand their services and tap into new business fields. Like the music industry and cable TV, the publishing industry is “[undergoing a massive adaptation process](#)” in relation to the changes coming with digitalization and online distribution. These developments are described in the much-cited 2019 [landscape analysis](#) of the “Scholarly Publishing and Academic Resources Coalition” (SPARC), commissioned in response to the “growing trend of commercial acquisition of critical infrastructure” and co-written by a market analyst with long experience in the academic publishing market. The report has been updated several times since.

To make up for losses in their core business and organize future growth strategies, as the report shows, publishers (with Elsevier taking the lead) are currently shifting and expanding their business models from providing academic content to becoming encompassing knowledge platforms (see also the [DFG paper](#)).

To illustrate this: the publisher Elsevier [describes](#) itself as a “global leader in information and analytics”, and Taylor & Francis [depicts](#) its services as “content and research platforms”. In other words, academic publishers no longer limit themselves to the dissemination of research output in the form of journal articles and books, but have rather started to offer services covering an increasing spectrum of the research (and educational) spectrum.

For example, the services offered today cover research assessment systems, productivity tools, and online learning management systems (see the [2019 SPARC landscape analysis](#)). Publishers are thus increasingly expanding into the governance of university and research institutes more broadly. Elsevier’s “Pure” Research Management System for example, according to its self-description, “facilitates an evidence-based approach to your institutions’ research and collaboration strategies, assessment exercises and day-to-day business decisions”. One strategy of publishers is also to bundle different services and sell them in packages or “big deals” (on this, see the [2020 update](#) to the SPARC landscape analysis). An extreme example that caused an outcry in the scholarly community was a contract concluded between a consortium of Dutch universities with Elsevier (see [here](#)). While the deal foresees access to journals and Open Access publishing at zero increase in total spending for the universities, in exchange it obliges the universities to license a large set of Elsevier’s data analytics products (including “Pure”).

In addition, the big publishers are [buying up](#) small and innovative Open Access publishers, and a closer look reveals that other academic services such as the reference tools Mendeley, Scopus, and the more recent Dimensions belong to them or their groups (see [here](#)).

As a result, publishers render themselves increasingly “indispensable for the governance of academic institutions and universities” ([DFG report](#), p. 6). The whole research and university infrastructure, the backbone of research and teaching, risks falling into the hands of commercial actors. Some already speak of an emerging ‘[knowledge industry](#)’. What is more, this development also favors market concentration, the loss of diversity, and the formation of monopolies or quasi-monopolies ([SPARC 2020 Update](#), p. 21). We may be currently witnessing the formation of a ‘[supercontinent](#)’ in the supply of research.



[Fibre optic cable rack](#). Photo by Lars Kienle, free to use under the Unsplash License.

A systematic threat to academic freedom

This development has far-reaching repercussions for the science system and academic freedom as enshrined in constitutional and human rights law. Even though on the international level there are no explicit guarantees, it is well-established today that academic freedom is covered by the guarantees of freedom of expression and opinion as detailed in Art. 19 ICCPR and Art. 10 ECHR or the so-called “right to science” under Art. 15 ICESCR (see this 2020 [report](#) on academic freedom and the freedom of opinion and expression and [GC No. 25](#) on the “right to science”(Art. 15 ICESCR)).

On the one hand, data tracking may infringe on the individual freedom of researchers. The [DFG report](#) warns that authoritarian regimes can use these tools to surveil their researchers under the guise of national security or public order, leading to self-censorship (on academic surveillance in general, see para. 48 of the [report](#) of the UN Special Rapporteur on academic freedom). As mentioned above, especially in the US, there have been instances of publishers selling data to law enforcement authorities, with a possible equally chilling effect. Tracking can furthermore facilitate data misuse and commercial academic espionage.

Besides these individual consequences, there is a strong systemic risk to free and autonomous research as an ‘institution’. Academic freedom not only secures individual liberties, but, importantly, also requires states to create the conditions and circumstances under which these liberties can be effectively exercised. The rich case law and scholarship on Art. 5(3) of Germany’s constitutional “Basic Law” makes

it clear that behind the goal of protecting the autonomy and the independent functioning of the science system stands the idea that knowledge can best advance under these circumstances. The German Constitutional Court has expressed in one of its landmark judgments (BVerfGE 47, 327 (370)) that “it is precisely a science freed from social utilitarianism and political expediency that best serves the state and society”. While this dimension of academic freedom is more elaborate and developed on the domestic level, it is also recognized on the international level. The UN Special Rapporteur on freedom of expression and opinion made it clear in his 2020 [report](#) on academic freedom (para. 9): “States are under a positive obligation to create a general enabling environment for seeking, receiving and imparting information and ideas. Institutional protection and autonomy are a part of that enabling environment”. This dimension is furthermore clearly reflected in Art. 15(2) of the ICESCR, requiring states to take the steps “necessary for the conservation, the development and the diffusion of science”.

Science sociologists have long argued that the economization or marketization of science threatens the autonomy of the science system as a distinctive value sphere in the Weberian sense or as an autonomous unit in the sense of functionalist differentiation theory. Indeed, some argue that, for science, “market fundamentalism is today more pressing than political totalitarianism” (see [here](#), p. 132). To better understand the autonomy of science as protected by constitutional law, it is helpful to look at the theory of the normative structure of science [developed by Robert K. Merton](#) and especially the idea of the *disinterestedness* of science, that is to say, that science should be in the interest of the search for truth, rather than pursue self-interest or economic gain.

With the current platformization of the science infrastructure, the marketization of science and the influence of the economic sphere on science arguably reach a new peak, fundamentally questioning the ideal of disinterested science. The fact alone that nearly the entire digital science infrastructure might soon lie in the hands of a small group of commercial actors is problematic from this viewpoint. Yet, there are a number of very direct consequences and ways publishers can influence the course of science. According to the [SPARC landscape analysis](#), the “companies can invisibly and strategically influence, and perhaps exert control, over key university decisions – ranging from student assessment to research integrity to financial planning” (p. 5).

Very concretely, the publisher Elsevier, based on the data at its disposal, might be in a position to predict the likelihood of success of individual researchers and, for example, could offer them editorial board positions. Similarly, it “could isolate in advance new trends in interdisciplinary studies, allowing it to establish publication forums where none exist today and even driving funding decisions which lead to accelerated growth for these types of research” (p. 15). The motivation is to gain competitive advantages. The fact that publishers now also offer tools to assess research has furthermore given rise to concerns regarding possible conflict of interests. The [2020 SPARC](#) update warns that even unintentionally biased algorithms might favor research in journals from the same publisher (p. 15). Another issue concerns the opaqueness of algorithms and their combination with increasing market concentration, which gives some actors huge amounts of power. In other words, “(o)ne Company (and one algorithm) may heavily influence decisions on which departments should grow in size and budget, which research projects should be funded, who should be promoted, etc.” (p. 21).

A complex problem requiring solutions on different levels

All of this shows a worrying degree of influence that academic publishers – private actors driven by

economic incentives – have on science. This fundamentally raises doubts about science’s autonomy from the economic sphere and the ideal of purpose-free science interested solely in the search of truth.

While certain new ‘inventions’ by publishers time and again cause an outcry in the scholarly community, such as recently Taylor & Francis’ announcement of the possibility to pay for faster peer review (see [here](#) for a reaction), the much deeper structural privatization of the whole infrastructure of science has not received sufficient attention. Even if one does not consider the influence of the economic sphere to fundamentally raise doubts about the functioning of science, the question clearly arises whether the science community wants to accept that central decisions in science are shaped and determined by commercial actors following a market logic and that infrastructural decisions determine the direction of science.

In this light, the [finding](#) by the 2019 SPARC landscape analysis should raise the alarm, and initiatives such as the petition “[Stop Tracking Science](#)” hopefully mark only the beginning of a broader debate.

We are at a critical juncture where there is a pressing need for the academic community – individually and collectively – to make thoughtful and deliberate decisions about what and whom to support – and under what terms and conditions. These decisions will determine who ultimately controls the research and education process; and whether we meaningfully address inequities created by legacy players or simply recreate them in new ways.

However, it would be wrong to assume that in the digital age, the main threats to academic freedom come from the private sphere. Rather, public actors are, on different levels, very much involved and at least co-determine the direction that development currently takes. It is public universities and libraries that conclude problematic contracts with private publishers, rendering them at least co-responsible for possible rights violations. A more indirect, yet structural involvement of the state concerns the managerial reform processes of the system of higher education ongoing in many countries, subjecting universities to quantitative performance pressure with the aim to make them more competitive against the backdrop of the belief that the key role of science in society is economic growth. While many of these debates originate in the US, they are also relevant for Europe (see, e.g., [here](#)).

(Legal) solutions to these issues of course need to start where it is most urgent, namely with taming the concentrated power of big publishers via antitrust measures and possibly platform regulation legislation. Yet, these measures alone will not be enough without tackling the underlying issues. Researchers themselves prefer to publish with the big publishers – because in today’s competitive system, they depend on the visibility that big publishers provide more than small ones. In light of the important role that publishers still have as gatekeepers and curators of knowledge, it furthermore seems necessary to discuss how meaningful alternatives can be established in the name of academic freedom – and whether, in light of the realities of today’s science system dominated by an ethos of competition, they will ever be accepted by the scholarly community.

A shorter version of this article has been published on [Verfassungsblog](#).

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