Early career researchers and predatory journals during the Covid-19 pandemic. An international analysis

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Abstract

Around 170 early career researchers (ECRs) from 8 countries were interviewed about the whole range of their scholarly communication attitudes/behaviours during pandemic times and this paper analyses what they said about predatory journals in a wide range of scholarly communication contexts. Because of the delicacy of the topic there was just one question exclusively directed at predatory journals, which asked about policies rather than actions, which yielded nevertheless wide-ranging comments on the topic. ECRs also volunteered information on predatory journals in another half dozen questions, most notably including one on questionable research practices. The source of data was mainly the final interview of three undertaken, with some comparisons made to rounds one and two. Findings disclose the existence of a whole raft of formal and informal assessment policies/codes that direct ECRs to legitimate journals and away from predatory ones. Despite being junior, ECRs are very accultured to the criteria of what is considered as prestige and quality and believe predatory publishing is not even conceivable. They are far more concerned about low-quality research, preprints and borderline 'grey' journals. The pandemic has increased the level of questionable practices and low-quality research, but predatory journals were only singled out by a relatively small number of ECRs.

Keywords

Predatory journals; Questionable research practices; Low-quality research; Preprints; Policies against predatory journals; Publishing; Research; Scholarly communication; Early career researchers; ECR; Pandemic consequences; Covid-19; Harbingers project; Interviews; Country differences; China; France; Malaysia; Poland; Russia; Spain; UK; United Kingdom; USA; United States.

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1. Introduction

As a host of editorials, opinion pieces and policy statements indicate, the increasingly felt presence of predatory publishing has been a matter of great concern in scholarly circles. Indeed, recent times have seen the inexorable rise of predatory journals: according to *Cabells Predatory Reports*, the number of predatory journals is currently over 16,000 (**Linacre**, 2022), a considerable increase from the 8000 or so identified in 2014 (**Shen**; **Björk**, 2015). Predatory publishing, disregarding editorial and publication practices for the sake of monetary gains, is thus widely held to be debasing scholarly research and polluting the scholarly communications system, indeed, to be a real threat to the very integrity of science, its credibility and trustworthiness (**Linacre**, 2022; **Ojala**; **Reynolds**; **Johnson**, 2020; **Shaghaei** *et al.*, 2018). With

the world, focussed as it is on COVID-19, by ignoring the issue of predatory publishing, things may even go from bad to worse (**Da-Silva**, 2020). However, with all that there are compelling deterrents against straying from the straight and narrow in scholarly publishing, researchers, independent of their age, status, country and discipline were found to have published in predatory journals (see literature review).

Much to our surprise, therefore, our findings in the four-year (2016-2019), longitudinal *Harbingers-1* research project which explored the working lives and scholarly communication behaviour of 116 junior science and social science researchers in eight countries (China, France, Malaysia, Poland, Russia, Spain, UK and US), indicated otherwise.

http://ciber-research.com/harbingers.html

Contrary to expectations, predatory publishing turned out to be quite marginal to the scholarly pursuits of ECRs: it was little practiced, with only one instance reported, and seen as an irritant rather than a danger to the scientific undertaking and its stakeholders (**Nicholas** *et al.*, 2021). When alluded to at all, it was only in passing, not even as a problem in itself, but as part of the problems surrounding open access publications and the possibility that predatory journals might bring about further deterioration in their quality (**Nicholas** *et al.*, 2017; **Nicholas** *et al.*, 2019).

True, as we speculated, the ECR participants in our study were not generally inexperienced or naïve, came from good universities and were part of research groups of high-flying, knowledgeable and practised researchers, so they were neither likely to fall prey to unscrupulous publishers nor come up with such low-quality research that their only option was publishing it in scam journals (**Nicholas** *et al.*, 2021). However, with the literature cataloguing many instances of senior researchers from developed countries publishing in predatory journals, as we will learn, our reasoning may not have captured the entire range of factors involved in the situation we were witnessing. Given the opportunity to continue our investigations of ECRs' circumstances in the *Early Career Researchers and the Pandemic – Harbingers-2* research project, funded by the *Alfred P. Sloan Foundation*, we decided to probe deeper into the question:
http://ciber-research.com/harbingers-2

Drawing our data again from the aforementioned eight countries, this time covering 167 ECRs from the sciences and social sciences, we thus set out to revisit young researchers' attitudes to and practices of predatory publishing.

2. Aims and objectives

The aim of this study is to explore the perceptions and practices of pandemic-era ECRs regarding predatory publishing.

Its specific objectives are:

1. To determine what ECRs think about predatory publishing, inclusive of the policies and practices that exist to prevent their use;
2. To establish whether early career researchers and/or their colleagues publish in predatory journals;
3. To identify national and disciplinary differences in opinions and practices, if any;
4. To see whether the pandemic has changed opinions and practices.

3. Definitions

ECR

For lack of a universally accepted definition of an ECR, indeed, with different and conflicting definitions of ECRs circulating (**Da-Silva**, 2021), a pragmatic conceptualization of an ECR was decided on. Thus, the definition focusses on the common denominators of their standing, that is, their being employed in a research position but, being relatively young and in an early phase of their career, not yet established as permanent faculty:

> "Researchers who are generally not older than 40, who either have received their doctorate and are currently in a research position or have been in research positions, but are currently doing a doctorate. In neither case are they researchers in established or tenured positions. In the case of academics, some are non-tenure line faculty research employees." (Authors)

Predatory publishing

Predatory publishing is definable as entities that, prioritizing self-interest at the expense of scholarship, are characterised by false or misleading information, deviation from best editorial and publication practices, a lack of transparency, and/or the use of aggressive and indiscriminate solicitation practices (**Grudniewicz** *et al.*, 2019), as well as by poor quality and/or misuse of peer review processes (**Dobusch** *et al.*, 2020). Predatory journals, often referred to as questionable, illegitimate, dark or deceptive journals, too, are therefore fake and scam publishing venues that accept manuscripts for fees, without sufficient quality control, while pretending the opposite (**Frandsen**, 2017). However, we did not define the term for our study participants, and indeed limited its use. In general, we wanted the ECRs to have ownership of the topic/concept and, in many cases, left it up to them to talk about it. It was also easier to do it this way given that the interviews were conducted in 5 languages and in 8 countries.

4. Literature review

Seeking to anchor the study reported here in the current state of the knowledge on the topic, the literature review, which follows, summarises, analyses and synthesizes the extant evidence pertinent to predatory publishing. The review protocol, developed for the purpose, had at its heart a list of keywords, distilled from the research questions and trialled by means of searches in multiple databases –*Google Scholar*, *Google Search*, *Web of Science*, and *ProQuest*. In its resulting, refined form, the list included the following terms: predatory/ questionable/ illegitimate/ dark/ deceptive/ fake/ scam journals/ predatory publishing/ questionable research practices/ pandemic/ Covid-19/ policies against predatory publishing.

Focussing on these keywords, systematic literature searches were conducted in the aforementioned databases to find the published literature on the topic as well as relevant 'grey literature', such as conference proceedings, theses, and reports. In an effort to make sure that all relevant studies were noted, backward as well as forward searches were conducted to identify germane work. The former, to include any important information in the studies cited in the articles reviewed, and the latter, to add new information reported in articles that have since cited the articles reviewed. Finally, backward and forward searches by key authors were performed to round out the emerging picture.

The extent of the threat to the scientific enterprise that predatory publishing poses became clear once it transpired that its presence in the scholarly world was not limited to novice researchers from developing countries, as first explorations seemed to indicate (**Demir**, 2018; **Frandsen**, 2017; **Kurt**, 2018; **McCann**; **Polacsek**, 2018; **Moher**; **Srivastava**, 2015; **Moher** *et al.*, 2017; **Nobes**; **Harris**, 2019; **Shen**; **Björk**, 2015; **Xia** *et al.*, 2015). Newcomers to academe from the Global South may have been in the eye of the predatory storm, but the socio-economic and geographical dispersion of the problem turned out to be much wider, extending to academics from high- and upper-middle-income countries (*IAP*, 2022; **Elliott** *et al.*, 2022; **Moher** *et al.*, 2017; **Segado-Boj**; **Martín-Quevedo**; **Prieto Gutiérrez**, 2022), as well as to the senior and experienced among them (**Alecci**, 2018; **Elliott** *et al.*, 2022). Indeed, researchers from Italy (**Bagues**; **Sylos-Labini**; **Zinovyeva**, 2017), Belgium (**Eykens** *et al.*, 2019) and Denmark (**Shaghaei** *et al.*, 2018) were found to have published in questionable journals, as did senior academics (**Alrawadieh**, 2018; **Eykens** *et al.*, 2019; **Frandsen**, 2022; **Perlin**; **Imasato**; **Borenstein**, 2018; **Pyne**, 2017; **Shaghaei** *et al.*, 2018; **Wallace**; **Perri**, 2018). Perhaps most tellingly, over 5000 researchers from German universities, institutes and federal agencies, inclusive of prominent professors, even a Nobel laureate, have also been found to have published articles in predatory journals with no peer review processes (*NDR*, 2018; **Offord**, 2018).

The prevalence of predatory publishing among scholars of all career levels and from all over the globe brought to the fore the need to discover why a researcher would choose a publishing venue that may not do justice to their scholarly achievements. Obviously so, for combating the predatory publishing problem is contingent on understanding researchers' motivations and incentives for straying from the straight and narrow in a decision that has been shown to be crucially important for their reputation and careers –choosing the 'right' publishing venue (**Nicholas** *et al.*, 2022). **Frandsen**'s (2019) analysis of the literature identifies two types of authors who take up the option: the uninformed and the unethical. Building on **Grimes**, **Bauch**, and **Ioannidis**'s (2018) modelling of science trustworthiness, she thus differentiates between researchers who do not intentionally behave dishonestly, but fall prey because they are not aware that the journal that they have published in is in fact predatory, and researchers who knowingly publish low-quality research in scam journals in order to pad out their publications list.

Indeed, researchers' lack of awareness that the journal chosen for publication may be questionable is cited in study after study among the possible explanations for their doing so (**Cobey** *et al.*, 2019; **Cohen** *et al.*, 2019; **Demir**, 2018; **Elliott** *et al.*, 2022; **Eriksson**; **Helgesson**, 2016; **Kurt**, 2018; **Noga-Styron** *et al.*, 2017; **Salehi** *et al.*, 2020; **Shehata**; **Elgllab**, 2018). This seems surprising, at least at first glance, as by now many more scholars must be acquainted with the ever-more acutely felt presence of scam journals, if for no other reason than because of the aforementioned admonishments constantly heard. However, admittedly, distinguishing between legitimate and deceptive publishing venues has become much more challenging, as we shall see.

The root of the problem is there is substantial diversity in types and degrees of predatory publishing, so much so, as **Siler** (2020) suggests, that predation in academic publishing can be perceived as a spectrum with varying types and degrees of illegitimacy, with journals and publishers of multiple shades of grey occupying borderline or ambiguous niches between predation and legitimacy. Thinking along the same lines, **Silva** *et al.* (2021) also posit that there exist degrees or dimensionality, whereby a journal may be increasingly/decreasingly predatory (or legitimate) in comparison to some standard or criteria (whether ideal or in relative contrast to one another).

In consequence, as **Dunleavy** (2022) argues, the use of whitelists, whilst certainly helpful for detecting and avoiding some bad faith actors in the publishing world, is inevitably limited. He identifies three main reasons that hamper the efficacy of these whitelists (reasons that seem to be no less applicable to blacklists):

1) the inability of scholars to agree upon a precise and objective definition of –or criterion for– the term 'predatory';

2) the heterogeneity and somewhat arbitrariness of characteristics subsumed under the 'predatory' label; and

3) the problem of 'false positive' and 'false negative' cases, i.e., when a non-predatory journal is mistakenly labelled as 'predatory' and vice versa.

Further muddying the waters:

- finding predatory journals in lists of accredited journals, such as *WoS*:
  https://mjl.clarivate.com/home
- encountering articles published in predatory journals in major indexing databases such as like the aforementioned *WoS*, and *PubMed* and *Scopus* (**Cortegiani** *et al.*, 2020; **Demir**, 2018; **Marina**; **Sterligov**, 2021; **Severin**; **Low**, 2019) or in popular social-media based platforms, such as *ResearchGate*:
  https://clarivate.com/webofsciencegroup/solutions/web-of-science
  https://www.elsevier.com/solutions/scopus
  https://pubmed.ncbi.nlm.nih.gov
  https://www.researchgate.net
- or coming upon reviews of them in the *Publons* database of review reports (**Severin** *et al.*, 2021):
  https://webofscience.help.clarivate.com/en-us/Content/publons.html

The difficulties involved in identifying predatory journals have become even greater now that scam journals ever-more successfully masquerade as genuine ones (**Gasparyan** *et al.*, 2015), mimicking titles or logos of prestigious, well-known journals, sporting a fraudulent IF and even exhibiting the outward furnishings of traditional and trustworthy journals, such as DOIs and ISSNs. The latter two, which are often available for the asking (if at a cost), perhaps should not be seen as quality indicators –but they are. At times predatory hijack legitimate ones by creating fraudulent websites that mimic authentic and reputable journals and their websites, abusing both established names and identities such as the ISSN, so that even experienced scholars have no way of knowing that what they see is not the genuine prestigious journal. Indeed, even knowledgeable researchers, who advise others about predatory publishers, may not be aware of hijacked journals (**Abalkina**, 2021; **Dadkhah**; **Borchardt**, 2016; **Dadkha**; **Maliszewski**; **Da-Silva**, 2016).

The unethical researcher, unlike the uninformed/unaware researcher, knowingly risks publication in a predatory journal because it enables them to build quickly and easily a publication record, and to do so without long turnaround times, high fees, unnecessarily critical peer reviews and a bias toward publishing the work of well-known researchers (**Cobey** *et al.*, 2019). It is certainly a minimal-effort process, which guarantees success in getting a work published even when it is not up to par, all for the sake of adding another line to a researcher's list of publications. No wonder that **Crotty** (2017) puts the blame for the rise of the predatory publishing phenomenon on the publish or perish driven incentive system of the scholarly world. As things stand now, he contends, with publishing in a predatory journal at times an informed, deliberate choice for some researchers, driven by the need "to minimize efforts and maximize advancement in a system with a lack of oversight in evaluation", predatory publishers serve "a market need, namely the desire by some authors to fool those in charge of evaluating their performance".

However, with the publication record serving in academe as the basis for attaining career-related benefits and at times even financial rewards, questionable it might be, but such padding of one's publication record may, in fact, turn out to be advantageous on the individual level. Indeed, as **Mertkan**, **Aliusta** and **Suphi** (2021) suggest on the causal factors involved in researchers' deciding to publish their work in predatory venues, the assumption that doing so leads to career risks does not seem to be supported by empirical evidence. Rather the contrary, as the studies they cite testify: publishing in predatory journals often had a positive effect on career progress but at least posed no risk, certainly not in countries where local assessment policies emphasise quantity of publications over their quality.

True, scholars on the periphery of the global scholarly enterprise have additional reasons, too, specific to their idiosyncratic circumstances, for finding predatory outlets attractive. Most notably, researchers from developing countries may prefer to publish in predatory journals because of concerns that legitimate Western journals might be prejudiced against scholars from non-Western countries or because, lacking the resources and guidance that researchers in more developed nations have, they consider their work less publishable in mainstream scholarly journals (**Demir**, 2018; **Kurt**, 2018; **Mills**; **Inouye**, 2021; **Tella**, 2020).

All in all, then, it is the acutely felt need to showcase one's scholarly productivity, which is the motivating force common to the uninformed and the unethical researcher, both of whom opt for publishing in a predatory journal with this very purpose in mind, if proceeding from different premises. Obviously, the current situation of a seemingly endless availability of journals that may –or may not– be legitimate publishing outlets can be confusing and/or tempting to any researcher, but even more so to an inexperienced researcher. If they are neither well-versed in the ways of academe nor well connected, they may choose a publishing outlet unaware of its questionable nature. However, even when they are well-aware of the suspect nature of a predatory journal, they may find it difficult to resist the temptation of choosing an easy, sure-fire way of publishing. After all, as ECRs, whose career advancement is wholly contingent on their productivity, they are very pressured indeed to publish. However, it is important to note here, that ECRs are certainly not predestined to publish in predatory journals. Thus, for example, as **Mertkan** *et al.* (2021) suggest it is international publishing experience rather than the length of their career or the number of their publications that counts, indeed, greatly diminishes the likelihood of ECRs' opting for predatory practices.

5. Methods

This paper focuses on the interview leg of the project, which was at the very heart of the *Harbinger-2* project. There were three rounds of repeat interviewing with 6-month gaps between each round, providing a longitudinal element to the study, although this paper focuses largely on the final and most developed interview, with some references to the two earlier ones.

5.1. Recruitment

The interview participants included both ECRs who participated in *Harbingers-1* (an earlier manifestation of the project) and new ones, recruited to fill the ranks of participants who had left research or no longer qualified as ECRs (e.g., because they obtained tenure). New ECRs were recruited by the eight national interviewers, utilizing their local networks and connections, with numbers supplemented by mail-outs from scholarly publisher lists. Each country was allocated a quota of interviewees (between 20 and 24) to achieve an element of representativeness in terms of age, gender and subject and also to ensure some consistency across countries.

5.2. Make-up of cohort

Originally, 177 ECRs were recruited and by the third round of interviews 167 remained, largely because a few had left academe. Table 1 provides a country and discipline breakdown of the cohort.

Table 1. Discipline and country breakdown of ECR panel (Round 3)

	Total	CHEM	ENV	LIFE	MATH	MED	PHY	SOCH[1]	SOCS[2]
CN	23	0	0	0	5	9	5	1	3
	14%				22%	39%	22%	4%	13%
ES	20	3	3	2	2	2	2	4	2
	12%	15%	15%	10%	10%	10%	10%	20%	10%
FR	17	2	0	2	3	2	5	0	3
	10%	12%		12%	18%	12%	29%		18%
GB	24	1	2	5	2	6	2	4	2
	14%	4%	8%	21%	8%	25%	8%	17%	8%
MY	20	1	0	3	4	2	2	5	3
	12%	5%		15%	20%	10%	10%	25%	15%
PL	22	2	3	3	3	3	4	1	3
	13%	9%	14%	14%	14%	14%	18%	5%	14%
RU	20	3	2	2	2	3	4	3	1
	12%	15%	10%	10%	10%	15%	20%	15%	5%
US	21	2	2	3	2	5	3	2	2
	13%	10%	10%	14%	10%	24%	14%	10%	10%
Total	167	14	12	20	23	32	27	20	19
	100%	8%	7%	12%	14%	19%	16%	12%	11%

5.3. Interviews

The interview protocol[8] contained a mix of closed, open and hybrid questions, covering every aspect of the scholarly system: job, status, career aims/progression, assessment, research directions, working life, reputation, as well as, their scholarly communications –collaboration searching/finding, networking, ethics, informal communication (preprints, blog posts, posters), social media, publishing; metrics, sharing outreach and scholarly transformations. All, of course, asked with the pandemic looming in the background.

Aware of the problems of asking, especially young and vulnerable (in terms of their jobs) researchers about a stigmatised form of scholarly behaviour –predatory publishing, we avoided, where possible, asking direct question and when we did, it was done generally and without giving any sense of targeting junior researchers. Thus, nobody was asked whether they published in predatory journals or knew of colleagues who did. There were, however, two questions that tackled the predatory issue in the broad:

- the first, about policies for avoiding predatory publishing asked as part of questioning about open access publishing;
- the second, about whether they were aware of questionable practices being employed and published and this was asked in context as part of a series of questions about integrity.

In order to discover where else predatory arose a keyword search was conducted on the database containing the transcripts. The terms predatory, blacklist, whitelist, low quality and grey were searched for possibly relevant material.

Interviews that were conducted in the local language were transcribed and translated into English. All the interview transcripts were transferred to a 'coding sheet' by national interviewers, which closely matched the questions of the original interview protocol. Closed questions and answers were coded consistently using relevant codes (e.g., y/n). Closed questions usually also included further commentary by the interviewees that supplemented their answers. Free-text data were analysed using thematic coding using the themes from the questions and any new theme emerging from the data.

6. Results

6.1. Policies on predatory journals

This was the topic of the one direct question on predatory journals and it was worded as such: 'Does your research team / department / university have a policy on avoiding predatory journals? There was a coded response of yes, no and don't know. If they said yes, they were asked for further details. The question deliberately did not ask about individual practices for ethical and honesty reasons. The free-text element to it did offer up some valuable information on the topic, with the question turning out, as intended, to open out a broader discussion on predatory journals.

Table 2. Policies for avoiding predatory journals: country analysis

Interview 3	Total	Don't know	No	Yes
CN	23	0	12	11
ES	18	3	7	8
FR	16	7	8	1
GB	24	10	6	8
MY	20	5	7	8
PL	22	9	6	7
RU	20	0	4	16
US	21	4	13	4
Total	164	38 (24%)	63 (38%)	63 (38%)

Of the 164 ECRs who answered the question 38% said there was a policy, the same percentage said there was not a policy they knew of and the remaining ECRs did not know. Table 2 shows that there was a considerable divergence between countries with Russian ECRs (16/20) most aware of a policy and French ECRs most unaware (7/16), largely because there are no French predatory journals, although there is lot of debate on what they call 'grey' journals (something picked-up on later). British ECRs stood out in that there was a large number of them who did not know (10/24).

One hundred and twenty-five ECRs offered an explanation for their coding and this was provided not just by those that said yes who were prompted to do this, but also by a few that said no or don't know. Those that said no or don't know either tended to say that while there were national policies they had not been put into practice at the university or departmental level or that there were just informal policies. In regard to the latter, a US medic explained:

> *I don't know if it's a policy, but we're certainly aware of how to avoid those, and I know our libraries try to push out information to us about being aware of that. I think we're pretty on top of that*.

A summation of the most important comments made follows and is analysed by country.

China

In order to understand the Chinese findings, it needs to be said that:

1) the term 'predatory journal' is alien to most Chinese ECRs, often they are referred to as "water-filled" journals, meaning they publish many low-quality papers which leads to a "dilution" in the journals' quality;

2) there are no general blanket policies/blacklists in China, but different fields have their own approved whitelists or journal ranking lists. Dealing with Chinese ECRs that said they were aware of a policy, most mentioned the existence of blacklists, which provide early 'warnings' (a frequently used term in China) of questionable journals or said they followed the directions of the Chinese Academy of Sciences. There were also comments made about 'punishments' for not following the warnings, which might mean losing your job or not being considered for permanent positions. For instance, a Chinese soft social[1] scientist told us:

> *There is no clear policy, but the deputy dean for research management is wary of predatory journals. Last year, someone was eliminated from the job application because he had published a paper in such journals.*

A mathematical scientist was even more fearful saying:

> *If I don't refer to it [the approved list], it won't be very pleasant.*

France

With only one French ECR saying they were aware of a policy in regard to predatory journals ("revues prédatrices"), it is not surprising that none of them took to explaining their coding further. This is largely explained by the fact that predatory journals are not mentioned / known / thought about in France because they do not penetrate the ECR's world and concerns. Blacklists are therefore unknown, and even the prestigious academic consortia *Couperin* prescribes no blacklist as it is considered unnecessary and expensive. For the moment, the old and outdated Beall's list is still the main reference. As in Spain, French ECRs tend to adopt international databases standards such as that of the *Web of Science*

(*WoS*) when it comes to choosing their journals, and avoiding others. The national interviewer for France adds that, as in Spain, *MDPI* and, also, *Frontiers*, are considered controversial open access 'grey' publishers who have seen the number of French papers published increase significantly these past few years.

Malaysia

Again, although less than half of ECRs said they were aware of predatory policies and fake journals (*Beall*'s list was mentioned as a blacklist by a few of them), they seemed only too aware of only publishing in listed or trusted titles and how best to avoid the trap of publishing in journals, which would not count in their research assessment. Thus, this physical scientist explained:

> *Faculty always update us with list of predatory journals. I find it quite a big issue for researchers – if you find yourself publishing (previous) in predatory journal, it would be a waste and not counted.*

ECRs commonly spoke of whitelists which guided them rather than policies, as this Malaysian hard social[2] scientist put it:

> [I don't know of policies] *I guess because we strictly publish in whitelist*.

WoS and *Scopus* were also mentioned in this context of whitelist where indexation status in these databases plays a major criterion for Malaysian ECRs in deciding where to publish (**Nicholas** *et al.*, 2022).

Poland

In the case of Poland, it is not so much a case of where you should not publish, but where you should. So, like France, there are no lists of predatory journals ("czasopisma drapieżne"), just the ministerial list of journals (built upon *WoS* and *Scopus* lists) that attract reputational points for Polish ECRs. A third of ECRs said they were aware of policies, but yet again they turned out to be thinking of unofficial and informal policies as well, and the exercise of just common sense. There was also a dismissive attitude towards the question, such as why ask me, we know what we are doing? For instance, a physical scientist said:

> *I have not heard about such journals*

and a soft[1] social scientist said this:

> *Hard to say, I ignore such magazines.*

Another soft social scientist, got to the heart of the matter:

> *I do not know if this is formal, but since the ministry does not give credit for such publications, the university does not give money for publications in such journals either, and this is clearly written in the application for funding for research activities.*

Meaning if you went ahead and published in predatory journals you would not be rewarded, indeed, you would miss out.

As in Spain and France there is some discussion whether *MDPI* is good or a predatory publisher, but nothing official has happened regarding this in respect to the Ministry list. Some ECRs published in *MDPI* because the journals there are high (citation) scoring journals, and that absolves everything.

Russia

In Russia, the policy on avoiding predatory journals ("Hishchnicheskie zhurnaly", "musornye zhurnaly") differs among research institutions, including universities. Instead of official policy, as a rule they prepare reference lists of highly-rated international journals listed in *Scopus* and *WoS* showing where researchers should publish in order to ensure their grant and work reports are accepted. In addition, some research institutions monitor journals excluded from reference databases and put these lists online. And this must be what ECRs were thinking of when over three-quarters said they knew of policies, the biggest proportion of all our countries. Looking more closely through their individual comments, even those that said there were policies, in fact, they were referring to an unofficial "code of honour" to avoid such journals. The following quotes are illustrative:

> *I have not seen or read any specific university documents or anything like that. But here we are making sure that this does not happen* [Mathematical scientist]
>
> *It's even scary to even hint about publishing in such journals.* [Physicist]
>
> *This is not policy; this is an adequate sense not to do so. I don't know, no one teaches us this. It's just obvious.* [Chemical scientist]

Spain

Less than half of Spanish ECRs said they were aware of policies, but even more (and some of the former) said they were directed where to publish and the *WoS* list is for most of them their 'Bible' when it comes to choosing journals. They also mentioned the guidelines of *Aneca*, the national agency for researchers' assessment, which in 2021 published a list of questionable journals. ECRs were generally more uncomfortable about publishing with *MDPI*, a big publisher, because many of them are on *Aneca*'s list and for them that is bad news because they can publish in *MDPI*'s journals which is

relatively easy for them and pay the APCs (a big bone of contention for Spanish ECRs) with vouchers obtainable for peer reviewing for the publisher. The other methods for avoiding predatory journals mentioned was to publish in prestigious journals, the 'same' journals or only in Spanish or Portuguese ones –the assumption being that predatory journals were mainly English language ones. It would be true to say that Spanish ECRs are not as familiar with the concept of a predatory journal ("revista depredadora") as those of the UK and US.

UK

One-third of UK ECRs said they knew of policies. An even higher proportion said they did not know with a good number of them saying they were not necessary as everyone knew what a predatory journal looked like and, anyway, they only submitted to those journals they knew or had published in. This mathematical scientist spoke for many:

> *No policy per se, but of course we avoid predatory journals and submit manuscripts to well-known and respectable journals.*

This was echoed by a medical scientist:

> *Use credible journals that have previously been used in the field.*

There were also references from two ECRs to the role that libraries played:

> *There is no policy that I am aware of, but we do get regular emails from the library staff warning us of the latest predatory journals and emails.* [environmental scientist].

Thus, ECRs with one exception, thought the idea about publishing in predatory journals was ludicrous, since they would never submit to a journal, they were unfamiliar with. The exception had done their first two degrees in an African university and had published in predatory journals. He said by doing his doctorate he was learning a new and better way of doing science.

US

Just 4/22 ECRs were aware of official policies, so the US appears to be a policy free zone in respect to predatory journals, although many have heard of journal lists they are not supposed to publish in, but rarely go to because they are very aware of the problem, as this medical scientist explained:

> *I don't know if it's a policy, but we're certainly aware of how to avoid those, and I know our libraries try to push out information to us about being aware of that. I think we're pretty on top of that.*

A physicist put it more succinctly:

> *The policy is: don't do it*.

6.2. Awareness of questionable practices

There were clearly opportunities for predatory journals to be mentioned in many other questions asking about scholarly communications (around 50 all told), and most notably, the one about questionable practices. ECRs were asked whether they were aware of questionable practices being employed and published and, if so, whether they had become more prevalent during the two-years of the pandemic. The term 'questionable' was employed because we wanted ECRs to have ownership of what they thought was involved and 'aware' was used because it is a problematical question and we did not wish to infer that they were guilty of such practices, or, indeed, people they worked with. A large proportion of ECRs did know of questionable practices. Two-thirds (99/157) said they did and as many as a third (39/118) thought the pandemic had made things worse. ECRs were asked to explain their coding and nearly 100 ECRs provided a free-text comment. What was regarded as being questionable was very wide-ranging and evenly spread: multiple submissions, fake papers, fraudulent peer reviewing, plagiarism (including self-plagiarism), duplicate submissions, bogus authorship, lack of reproducibility or verification, paper factories and paying for papers, same data published a number of times and selective reporting (p-hacking, the misreporting of true effect sizes in published studies; it occurs when researchers try out several statistical analyses and/or data eligibility specifications and then selectively report those that produce significant results). This is a long and worrying list, but predatory journals were, surprisingly, only mentioned by name twice in this context. Once, by a British life scientist, who pointed out that 'proper' journals are guilty of questionable practices too:

> *This is true of journals with good impact factors as much as local journals – not just predatory journals*.

The other, from a Malaysian soft social scientist, mentioned the problems of differentiating between predatory and non-predatory because of 'phishing' journals which

> "*often praise your previous work, then ask you to submit to their journal*" tricking them into thinking they are conventional journals. *It's a new issue now,* they said.

In addition, half a dozen ECRs thought it was not so much questionable practices, but low-quality practices and superficiality brought on by light-touch peer review alleged to have been introduced to meet the need for speed in disseminating important information during the pandemic. Low quality and preprints seemed to be associated in ECRs minds and predatory journals were hardly mentioned in this context. Some ECRs levelled the blame for the prevalence of low quality papers at competition, as one Spanish chemist said:

> *It's because people have to compete more for positive evaluation, funds, etc.*

Poor ethical training was also blamed. A British medical scientist, however, warned it would only get worse:

> *It is going to get bigger and bigger as a problem as more material gets published – it's linear with quantity of work being done and being published. The pandemic has produced accelerated publishing processes, which translate to "light touch" peer review, also contributing.*

6.3. Mentions of predatory in other questions

In order to determine whether other questions had given rise to comments on predatory journals, a search for the term predatory and related terms, such as whitelist, blacklist and low quality was undertaken on all the free-text comments furnished in R3. The search identified 6 questions and after deleting false positives, that produced a total of just 11 mentions. The questions and responses were:

Q. Achieving visibility for research outputs is argued as being important in building reputation: do you agree?

A. The mention here, from a Chinese medical scientist, was in effect a warning suggesting that the relentless *pursuit of visibility could be associated with low quality channels, such as preprints and predatory journals*. So, care needed to be taken when pursuing such an objective.

Q. How do you decide to trust informally disseminated evidence in your own specialisms. Answer in respect to blogs and posters.

A. [I Trust] *Blogs only as long as they are not tied to a predatory journal, same for posters* [Polish soft social scientist].

Q. Have your attitudes to established scholarly communication practices, largely based on traditional journals, changed?

A. *Attitudes have changed due to the fact that I have changed. I just know more and understand how publication, journals work, what they are. Just experience and that's it. When you are just starting your academic career, you do not understand anything. Then you, for example, begin to distinguish predatory journals. It's hard to do in the beginning because you don't understand the interaction structure*. [Russian chemical scientist]

Q. Is there a big opportunity for the current generation to fundamentally change way in which the scholarly communication system works?

A. [Yes] *Towards more openness. Also to move against what many call predatory journals, such as Nature because of cost of APCs. This generation does not accept this or to fill the pockets of publishers. Now people are looking elsewhere*. [British environmental scientist]. This is an interesting take on the meaning of the word 'predatory' and included here for that reason.

Q. What role will libraries have for researchers in ten years' time as compared to their current role?

A. *I think libraries are increasingly important. There are predatory journals and hiccups accessing things. In the digital world, there is so much stuff evolving to navigate. Having a skilled librarian is absolutely critical, even more so now than it used to be.* [US medical scientist]

Q. When choosing a journal to submit their paper to which factors rate most highly: f) geographical location.

A. *I pay attention to journals coming from Asia as sometimes they are predatory* [French life scientist]. The ECR is basically saying that is a factor which determines where not to publish.

6.4. Comparisons with round 1 of interviews

Because the predatory direct question was only introduced for the third round of interviews held in Summer 2022, we deal with the first round of interviews held in Spring 2021 separately, as the data would not have been fully comparable. With ECRs with no direct or obvious outlet for comments on predatory journals we need to look to see whether they surfaced elsewhere and if so where. Overall, roughly the same proportion (two-thirds) said they were aware of questionable practices. But it was in respect to mentions we see the real differences with interview 3. There were in fact 24 mentions all told and half emerged in the questionable practices question. The R3 figure as we have seen was 2. Amongst these, a Malaysian life scientist gave a very interesting answer, ascribing predatory publishing to the fact that researchers in developing countries wished to replicate research found elsewhere in the context of their own countries leading to weak research:

> *Publishing in predatory journals, I would say that it is more about the low-quality work. A lot of low-quality work is being published in my field, in predatory journals, because the problem now is people are publishing what found in other countries in their context. They like to emulate what others have done, and put it in their own context, and it cannot be done, not enough information to go around and that I regard it as low-quality work.*

A French mathematical scientist, pointed to wholesale and ingrained questionable practices occurring a developing country:

> *Publishing in predatory journals, because in Columbia, there are incentives to publish papers, the salary is accorded to the paper you have. Many professors have published in predatory journals, a terrible practice. There is also the sausage* [salami] *publication phenomenon. There is very little control and the big risk is that students may reproduce these bad practices".*

A high proportion of the free-text comments mentioning predatory were in regard to whether the pandemic was responsible in some way for an increase in questionable practices, and such comments were largely missing in R3. Those who said the pandemic had made a difference said:

> *I only saw spam from predatory journals being more frequent in my email box.* [French mathematical scientist]
>
> *Predatory publishing* [is on the increase]*, journals asking you to review papers that are not at all in your areas. Even good IF journals (are also) citing predatory journals.* [Malaysian life scientist]
>
> *Perhaps possible predatory journals, I've heard about them and I keep clear. I mean, I would rather not publish than go for a journal that openly is asking for papers.* [Malaysian hard social[2] scientist]
>
> *Publishing in predatory journals, even we have motivational speakers (making speeches) on scientific publishing having (published) papers in predatory journals.* [Malaysian hard social scientist]

Those who said the pandemic had not responsibility made the following comments:

> *No. It's about publishing in predatory journals, either intentionally or maybe you are being trapped to publish there. But it's tricky to differentiate because some of these journals hide under Scopus (indexed by Scopus).* [Malaysian soft social scientist]
>
> *Plagiarism and predatory publishers. I don't think they have anything to do with the pandemic, maybe only predatory publishers and a rash of low-quality publications related to the pandemic. Low quality because they are prepared and conducted in an unreliable manner or "stretched" to fit the pandemic theme.* [Polish medical scientist]
>
> *No. Not necessarily more prevalent. I've noticed more of this activity over the last few years. Some COVID-related research may have found its way into predatory journals.* [US medical scientist]

Predatory journals cropped up in other questions in R1, too, and in many different contexts as the following comments illustrate:

Q. What were the criteria by which they were assessed?

A. *The formal criteria are minimal and I do not remember exactly what they are. It seems one participation in an international conference and one article, but not from predatory journals.* [Russian environmental scientist]

Q. Do they judge their success as a researcher (and that of others) by citation metrics, such as journal impact factors and/or h indexes?

A. *Partly, high impact factor journals can be both good and bad journals. There are predatory journals (with a high impact factor) which have a large circulation and high fees. However, for journals with higher impact factors, regardless of those unqualified journals, its papers are indeed better than those with lower impact factors* [Chinese medical scientist]

Q. Are you sympathetic to improving ways in which scientific research output is evaluated by taking into account of openness and transparency factors?

A. *Yes, many researchers in developing countries do not have research support or English language support. Very little is done to address this. The consequence is the use of predatory journals, etc.* [UK medical scientist]

A. *In general, yes, but: 1) On the one hand, the fact that a person can have access to an article without problems is very convenient. But a lot of open publications are paid for, and this raises the issue of research quality. There are cases of minimal peer review, or, when the article is not accepted, someone can pay and easily get published; 2) There are editors who say, why do you need a publication in this journal? Go to our subsidiary OA journal, pay there and you will be published for sure, you have passed the editorial board and I can advise you. Thus, on the one hand, for the ECR, OA is good and convenient, but the question of quality arises: if there is money, then it is possible not to improve the article and submit untested data, and it will be in the OA paper. But it depends on the level of the publication.* [Russian chemical scientist]

The ECR does not actually use the predatory word but it is plain that is what they are talking about.

Q. Does the peer review system need improving?

A. *It could be better if it was paid, but it would be difficult because the open access character of the journal would be in danger, it could become "predatory peer review"* [French mathematical scientist]

Q. Have you/your team a policy in regard to OA publishing?

A. *No mandate policy from the national government level, but there are some university level policies in regard to OA, my university made a blacklist for OA journals. Publishing papers in the blacklisted OAJ will be punished. I think OA is something worth encouraging, but in the domestic context of evaluating people it is problematical.* [Chinese mathematical scientist]

Q. Will journals still have a central role to play in five years' time?

A. *The academic community is highly inert and does not change so quickly. Therefore, the role of journals in the next five years will not change much. The criteria for journals will change, because there are too many of journals, and it is very difficult to find out those journals are worth reading and publishing, and those journals that we conventionally call garbage / predatory.* [Russian hard social scientist]

6.5. 'Grey' journals enter the debate

Because ECRs were allowed ownership of the term 'predatory' and asked about it in the broader context of scholarly communications, as we have seen, it allowed them to raise concerns around the topic's boundaries. This is especially important given the topic is clearly in transition as we have seen in the literature review. As it turned out, their concerns were not so much predatory publishers, but those 'grey' publishers, thought by some, to be on the margins who employ peer review but who have commercial/fast/proactive practices that may be seen as unethical and questionable. This was particularly the case with French, Spanish and Polish ECRs. As we saw from the quotes, the 'grey' publishers they exclusively mention in this connection are *MDPI*, a Chinese owned publisher and *Frontiers*, an Indian owned publisher.

Thus, in the final round of interviewing, 23 (14%) ECRs mentioned *MDPI* or *Frontiers* in various scholarly communication contexts. The most common mentions (5) occurred in answers to the question about predatory journals. ECRs said they were aware that there were issues raised about the non-standard, proactive methods of these publishers (sometimes reminded of it by local university directives, such as given in Spain and Poland), but ECRs were tempted to publish with them because of the speed and convenience of publishing with them, especially for those titles indexed by *WoS*. A Spanish mathematical scientist explained it like this:

> *When we need to publish fast, we use MDPI but now we try not to publish there because they are not well considered for assessment.*

The other mentions of relevance concerned reviewers being rewarded with credits, which contribute towards APC payments for papers published with them. Some thought this was a good idea while others were not sure as this Polish chemist was:

> *Fixed rates for reviewers - I would change the way reviewers are rewarded at MDPI, because now a lot of people do a lot of these reviews because you can get a discount on publication for doing each review - this is not good.*

Many more (a quarter, 38) ECRs mentioned these two publishers in interview 2 and again the most mentions arose from the question about predatory journals (6), again mainly showing that ECRs were in two-minds about the operations of these publishers, for instance, appreciative of the speed of the process (two weeks it is said and (sometimes) the rewards for reviewing, but worried about the consequences of such speed – hurried or short reviews, for instance. Another question about how to improve peer review elicited 4 mentions of the methods employed by *MDPI*. They were split between those that thought the rewards offered for reviewing were a good idea or not, with one Polish medical scientist, very much in the latter camp, saying:

> *... the American Diabetes Society requires reviewers to have specific parts in the review that must be mandatorily considered. A minimum number of characters would have to be introduced, as I have seen one-sentence reviews in MDPI. Vouchers exacerbate the phenomenon of unreliable reviews.*

There were just 22 mentions of the two publishers in the first interview where there was not a question on predatory journals. The comments of relevance concerned initiatives for quicker and more efficient peer review developed for the pandemic and publishing on new OA platforms.

7. Conclusions

After two-years of interviewing around 170 ECRs about every aspect of the scholarly communications system and how it was bearing up under the pressure of the pandemic it is clear that while questionable practices are thought to be widespread, and on the increase, predatory journals are not a big concern. Despite being novice, although not naïve, researchers and driven to publish papers to survive and prosper, they have not been tempted to publish in predatory journals (or, indeed, use them), despite being bombarded by email requests to do so. Often ECRs do not even want to talk about them much because they were not a feature of their research world where a research 'code of honour' and a certain dragooning ensures they are never even in the frame for predatory publishing. Just one ECR, in a previous job, admitted to doing so and this was confirmed by checks on their CVs. However, low quality research really did concern them and they came across quite a bit of it being the research workhorses they are, but they do not necessarily link this with predatory journals. They are more likely to talk about open access journals, preprints and so-called 'grey' journals in this regard. The boundaries of concern have widened.

From the very start of their careers ECRs are shepherded to publish in legitimate journals by a whole array of factors: university/government policies, prescribed trusted lists, research team colleagues, collaboration partners, their own libraries, who appear to be increasingly involved, and a healthy understanding of their own best interests. They are far from being whet behind the ears and they certainly know what predatory journals *et al.* are, and they would certainly

not publish with them accidently or though ignorance. Many of their stark and abbreviated comments on predation have been chronicled in this paper and they clearly betray not so much a lack of interest or concern, but more an irritation that they have been asked something silly or juvenile. Instead, they tend to debate and criticise the low or poor quality of research outputs and publishers pushing the boundaries. They also have other fish to fry, partly as a result of the pandemic, such as the acceptability and status of preprints and the credibility of speedily reviewed papers.

Nearly a quarter of ECRs felt that the pandemic had inflated questionable practices, which is a sizeable proportion, but only a minority mentioned the rise of predatory publishing in this context and although there was a general sense it had helped usher in accelerated publishing processes, which translated into "light touch" peer review and produced low quality research outputs.

Finally, **Linacre** (2022) argues that the real 'predator effect' is the risk that society at large is exposed to journals purporting to be scholarly and peer reviewed presenting articles that have not been validated and contain disinformation or 'junk science'. However, while ECRs were not ignorant of such concerns and, indeed thought this was a significant and growing risk the finger of blame was not pointed at predatory publishing alone, but to to a general lowering of standards that have occurred over the last few years. The message is almost move on (from predatory) and address the real issues that are degrading the research base by stealth.

8. Notes

1. We include within the "Soft Social Sciences": Anthropology, Political Science and Sociology.

2. We include within the "Hard Social Sciences": Economic and Business Sciences, Geography and Psychology.

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