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Early Career Researchers on all Aspects of Peer Review: A Deep Dive Into the Data

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ABSTRACT

The Harbingers study of early career researchers (ECRs) and their work life and scholarly communications began by studying generational—Millennial—change (H-1), then moved to pandemic change (H-2) and is now investigating another change agent—artificial intelligence (AI). This paper from the study constitutes a deep dive into the peer review attitudes and practices of 91 international ECRs from all disciplines. Depth interviews were the main means by which data was collected, and questions covered ECRs as reviewers, authors and readers, and are described in their own words. Main findings are: (1) ECRs proved to be a highly experienced in peer review; (2) There is more trust in peer review than distrust in it, but there are concerns; (3) Peer review is something that arts and humanities ECRs are unfamiliar with or much concerned about; (4) A sizeable majority of ECRs thought peer review could be improved, with anonymity/double-blind reviewing topping the list; (5) The majority view was that AI will have an impact on peer review and that it would be beneficial; (6) little has changed since the last Harbingers study, except for AI, which is seen to be transformative. We believe that few studies have drilled down so deeply and widely in respect to ECRs.

1 | Introduction

We are in the unusual and privileged situation of being able to examine peer review from an international and multi-disciplinary standpoint and from the perspective of researchers as authors, readers and peer reviewers. Thus, against the background of the longitudinal portrayal of ECRs' peer review-related attitudes and activities, as it emerges from the Harbingers project (Jamali et al. 2020, 2023; Nicholas et al. 2017, 2019, 2023; Rodríguez-Bravo et al. 2017), the findings reported here focus on the latest developments in this area now that the presence of AI is increasingly being felt. Indeed, as part of a wider exploration of novice researchers' AI-associated thoughts and

pursuits in five countries—China, Malaysia, Poland, Portugal and Spain—complemented by initial observations from the UK and the US, in this paper we set out to establish how the crucially important, but much-criticised peer review mechanism fares now. Is it changing or at least about to change, possibly as a result of benefitting from AI-driven technologies, as a host of hopeful prognostications would have us believe (Bauchner and Rivara 2024; Bhosale 2023; Biswas et al. 2023; Butson and Spronken-Smith 2024; Carobene et al. 2024; European Research Council 2023), and if so, with what consequences for research? What occurs when a new technology comes into the hands of junior/young researchers is, of course, always of great interest and importance and the results are reported here.

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Summary

- While peer review is a universally accepted tenet of research, countries differ about what the big concerns and issues are.
- The concern in China is peer reviewing in humanities and social sciences; in Spain, it is poor selection of reviewers, and in Malaysia, the lack of formal training in reviewing.
- There is more trust in peer review than distrust in it, but there are concerns, and ECRs are very vocal about this.
- Peer review is something arts and humanities ECRs are not as familiar with as their sciences and social sciences colleagues; indeed, they are less concerned about it, focussing on monographs in their publishing, which, traditionally, are not subjected to peer review.
- Two-thirds of ECRs thought peer review could be improved, with anonymity-double-blind reviewing topping the wish list.
- Majority view was AI will impact peer review and that it would be beneficial, but few ECRs thought it would totally replace the current human-based system.

2 | Aims and Objectives

Our aim is to explore comprehensively and in detail the whole gamut of ECRs' perceptions and experiences of peer review in five case-study countries (China, Malaysia, Poland, Portugal and Spain), focusing in doing so on any AI-associated, possibly long-term changes that have been taking place in its processes. Within this broad aim, the paper shall seek to find out:

1. How experienced are ECRs as peer reviewers?
2. How experienced are they in responding to criticisms of their groups' publications?
3. How much do they trust peer review?
4. Do they believe peer review could be improved, and if so, in what ways?
5. How important do they consider forms of peer review in selecting publications to read?
6. What do they hold to be the main impacts of AI on peer review (if any)?

3 | Scope

The findings reported here come from the pathfinder phase of the third leg of the Harbingers study of the work-life and scholarly communications of ECRs. The study, which began by studying generational—millennial—change (Harbingers-1,¹ 2016–2019) and which then moved to pandemic change (Harbingers-2,² 2020–2022), will be focusing on another change agent—artificial intelligence (AI). The data presented below are drawn from in-depth interviews with a convenience sample of 91 ECRs, based mainly in five case study countries—China, Malaysia, Poland, Portugal

and Spain, although initial observations derived from several interviews with UK and US ECRs are included too to complement the picture. Thus, whilst it is a collaborative international study, and the findings are placed in a national context, the differences in the size of the national cohorts mean that country comparisons can only suggest topics for a much more extensive investigation. However, it is precisely what we were looking for in this pathfinder/preparatory phase of the intended Harbingers-3 project.

4 | Definitions

4.1 | Early Career Researchers

With different, conflicting and country-specific definitions of an ECR circulating (Teixeira da-Silva 2021), a pragmatic conceptualisation of the term was decided on. Our definition of an ECR thus focuses 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 are generally not older than 40,³ 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.

4.2 | Peer Review

Peer review, as Ross-Hellauer (2017) suggests, is the formal quality assurance mechanism whereby scholarly manuscripts (e.g., journal articles, books, grant applications and conference papers) are made subject to the scrutiny of others, whose feedback and judgements are then used to improve works and make final decisions regarding selection (for publication, grant allocation or speaking time).

4.3 | Artificial Intelligence (AI)

Artificial Intelligence (AI) is definable as a technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy. However, it is generative artificial intelligence (AI) systems and tools that have been the talk of the scholarly world for quite some time now, with those based on large language models (LLMs), such as ChatGPT, attracting the most attention. Generative AI refers to deep learning models that can create complex original content, such as long-form text, high-quality images, realistic video or audio, in response to a user's request (IBM 2024).

4.4 | Subject/Disciplinary Representativeness

It is important to note that whilst throughout the life of the Harbingers project we covered Science and Social Science ECRs, it is for the first time here that Arts and Humanities ECRs are

included. Indeed, given the relatively high numbers of Arts and Humanities participants (33, over a third of the cohort); we are in the position to make exploratory comparisons between them and those in other disciplines.

5 | Literature Review

Peer review, the ‘social mechanism through which a discipline’s “experts” maintain quality control over new knowledge entering the field’ (Berkenkotter 1995, 245) is arguably one of the most controversial components of the scholarly communication system.⁴ As discussed elsewhere (Nicholas et al. 2023), whilst peer review is consensually held to be vital for safeguarding the quality, novelty, reliability, soundness, theoretical and empirical validity and potential impact of research (Eve et al. 2021; Nicholas et al. 2015; Tennant and Ross-Hellauer 2020), the mechanism utilised for its conduct has been found to be wanting. Indeed, it has repeatedly been shown to be insufficiently equitable and fair (Brezis and Birukou 2020; Demarest et al. 2014; Haffar et al. 2019; Lee et al. 2013; Roumbanis 2022; Silbiger and Stubler 2019), as well as less effective and efficient than warranted, especially these days, when the growing number of submissions put it under great strain (Allen et al. 2022; Brainard and You 2018; Christie et al. 2021; Horbach and Halfman 2018; Kankanhalli 2024).

Hardly surprisingly then, there have been numerous initiatives aimed at making the peer review and quality assurance processes better quality and reproducible, more democratic and transparent, more equitable and inclusive, and more efficient and incentivising (Ross-Hellauer 2017; Tennant et al. 2017; Waltman et al. 2023; Woods et al. 2023). Inevitably, perhaps, the enthusiastic introduction of AI-driven technologies to research raised great hopes as to their capabilities to assist in this quest for improving the peer review system, too.

However, not much use is made of AI tools for peer reviewing purposes: for example, in a Nature survey of 1600 researchers, reviewing manuscripts was ranked among the least popular uses of AI-assisted tools, and as the least popular of the benefits accorded to these tools (Noorden and Perkel 2023). In another Nature survey, this time of postdocs, none of them said that they used chatbots to assist in peer reviewing (Nordling 2023). Not very surprisingly, as the practice is not recommended, indeed at times prohibited by some prominent journals. Thus, for example, the American Association for the Advancement of Science—which publishes Science—allows for some use of AI tools during manuscript preparation, but still bans their use for peer reviewing (Prillaman 2024). Similarly, Springer Nature asks peer reviewers not to upload manuscripts into generative AI systems, noting that these still have ‘considerable limitations’ (Chawla 2024).

Still, progress has been made towards laying the foundations for harnessing AI tools to peer review, although first experiments have come up with conflicting findings as to the correlations between human and automated decisions. Thus, Liang et al. (2024) found the extent of overlap between ChatGPT-produced and human reviews to be like that between two human reviewers, around 30%, as well as positive user perceptions of the

usefulness of the AI tool. Similarly, Biswas et al. (2023) found in their single-article-based case study inter-rater agreement between the review provided by ChatGPT and those of three human peer reviewers, as well as a commendable capability demonstrated by ChatGPT to identify methodological flaws, to articulate insightful feedback on theoretical frameworks and to gauge the value of the new contribution to the field.

However, Saad et al. (2024) found differently, as their results showed poor agreement between ChatGPT and human reviewers, as well as between the two publicly available versions of ChatGPT, and ChatGPT’s answers were mildly or not at all correlated to final acceptance. Also, according to Kousha and Thelwall (2024), although they, too, found positive correlations between peer review judgements and AI-based ones, these results do not indicate impending progress, as an AI system would achieve a positive correlation by rejecting papers with obvious grammatical or referencing errors.

Baby steps taken then, but in the right direction... Still, as Kousha and Thelwall (2024) conclude for the time being, no current system challenges human reviewing, and human expert review remains the foundation of the scientific process. Indeed, it is with good reason that Kankanhalli (2024), Susarla et al. (2023) and Dis et al. (2023), inter alia, warn against using AI tools indiscriminately for reviewing and call for human, expert-driven fact-checking and verification processes always.

6 | Methodology

6.1 | Recruitment of Interviewees

National interviewers (from China, Malaysia, Poland, Portugal, Spain, UK and US) recruited ECRs, using their local research networks and connections supplemented by mail-outs from scholarly publisher lists. For the pathfinder/pilot phase, each country was originally allocated a potential quota of interviewees (10), but happenings on the ground did not work out quite according to plan. Malaysia, Portugal and Spain did recruit 10 interviewees each. However, in China, AI turned out to be a hot topic, with 21 eager ECRs recruited, and in the case of Poland, thanks to local funding,⁵ even more than that—32 ECRs. Indeed, as noted, for the very first time in the history of Harbingers, the availability of local funding in Poland provided an opportunity to include arts and humanities ECRs (22 of them). As local considerations delayed interviewing in the United Kingdom and the United States, just seven ECRs were recruited in time for participation in the pathfinder phase. Given the pilot nature of the project, the imbalance in country coverage was not thought to be a problem, especially as the opportunity to increase the size of the pilot to 91 ECRs, the attraction of extending the study to the arts and humanities, and the ability to take a closer look at China, with its growing importance in the international scholarly world, more than made up for it.

Interviewees included both ECRs who participated in Harbingers-2 and were happy to continue (26 of them), as well as new ones recruited to fill the ranks of participants who had left research, no longer qualified as ECRs, or declined because of work commitments or lack of interest.

The breakdown of the ECR cohort by country, discipline, gender and age-band are given in Table 1. Note especially the age of the cohort and how many relatively older researchers there are. There are three reasons for this. First, as for reasons of convenience we retained ECRs from previous stages of the project; they were all a year or two older. Second, it is the nature of academic, or indeed any employment, that not everyone moves forever upward. Third, some of researchers who were ECRs at the time of Harbingers-2 had since become tenured, so, technically, no longer fit our definition of an ‘early career researcher’.

6.2 | Data Collection

Semi-structured, free-flowing interviews of 60–90 min in duration were the main source of data. The interview schedule consisted of seven pages of questions,⁶ covering an exhaustive range of general scholarly communication questions as well as questions about AI and its impact on research activities. However, this paper focuses principally on the six questions asking specifically about peer review, although it did also look at mentions of peer review in the responses to all the questions. This is because ECRs are veritable research workhorses and multi-taskers, so that it was only to be expected that peer review would come up in questions other than those that asked directly about peer review, which indeed turned out to be the case, with 17 additional data sources found. The findings were supplemented and put in context by the national lead interviewers in the five case study countries—all experienced university professors, well-versed in the scholarly atmosphere and developments in their homeland.

6.3 | Data Analysis

All interview transcripts, having been read and approved by the interviewees, were translated to English where necessary and transferred by the national interviewers to a coding sheet, which closely matched the questions of the original interview schedule but left room for information derived from additional enquiries or clarifications during the interview process. Thus, the coding sheets, containing quantitative and qualitative data, as a question could and often did generate both, and capturing as they did quotations and sometimes explanatory comments from the interviewers, were multi-faceted.

7 | Results

7.1 | National Contextual Reports

National lead interviewers in the five case studies were asked to provide context for their interview data, not just to explain why their ECRs said what they did, but also to set their views against the more general peer-review mood that prevailed in their countries.

7.1.1 | China

Peer review is a critical mechanism in academic publishing, as it is in other countries in the world, but it faces several unique challenges and dynamics that reflect both global trends and local academic culture.

TABLE 1 | Demographic breakdown of cohort.

Discipline									
	CHEM	ENVIR	HUM/ARTS	LIFE	MATH	MED	PHY	SOCH ^a	SOCs ^b
<i>N</i>	7	4	23	6	9	12	16	5	9
%	8%	4%	25%	7%	10%	13%	18%	5%	10%
Country									
	CN	ES	GB	MY	PL	PT	US		
<i>N</i>	22	10	3	10	32	10	4		91
%	24%	11%	3%	11%	35%	11%	4%		100%
Age									
	Youngest (26–30)	Younger than most (30–34)	Median (35–37)	Older than most (37–39)	Oldest (39–51)	N/A	Median		
<i>N</i>	18	18	18	18	18	1	36		91
%	20%	20%	20%	20%	20%	1%			100%
Gender									
	Male		Female						
<i>N</i>	43		48						
%	47%		53%						

^aIncludes economics and business, geography and psychology.

^bIncludes anthropology, politics and sociology.

STEM and HSS disciplines are different in their peer review practices. In STEM subjects, peer review remains the primary method for assessing the quality and validity of academic manuscripts. China has rapidly risen in global research output, particularly in STEM fields, with a significant emphasis on international collaboration. As such, peer review systems, especially those modelled after global standards, are commonly accepted. Double-blind reviews are a favoured model, aiming to eliminate reviewer bias. ECRs are enthusiastic about engaging in peer review, as it offers an opportunity for visibility and academic contribution. In many cases, universities and funding bodies require ECRs to participate in the peer review process as part of their career development.

The peer review process in HSS subjects diverges significantly from that in STEM ones. This difference is rooted in the unique academic traditions of the humanities and social sciences in China, where metrics such as journal impact factors and citation counts are not universally regarded as reliable or suitable indicators of scholarly quality. Unlike STEM fields, where double-blind peer review is standard, many humanities and social sciences journals in China employ single-blind or even non-anonymous expert reviews. This means that reviewers may know the identities of authors, which can influence the evaluation process. The approach to peer review in these fields often emphasises a more holistic understanding of scholarship, valuing context, theoretical frameworks and cultural relevance over purely quantitative assessments. For these reasons, ECRs in HSS have the most complaints about peer review. They are generally dissatisfied with the peer review process, believing that their papers have not been fairly evaluated. Many authors even complain that their submissions were rejected without any convincing justification.

A key area of controversy involves the role of editors in screening papers before sending them out for peer review. Many reviewers complain that some manuscripts should have been rejected by editors outright due to poor quality. This problem is exacerbated by the rising volume of submissions to Chinese journals, particularly in prestigious fields like engineering and medicine.

Open peer review, where the identities of reviewers and authors are disclosed, has sparked debate in Chinese academia. Proponents argue that it increases transparency and reduces bias, while opponents fear it could lead to more politicised or cautious reviews, especially in fields related to policy, history, and social sciences.

There is increasing discussion about the role of AI in assisting the peer review process. AI tools are helpful with initial manuscript screening or even for matching papers to the most suitable reviewers. However, there is still significant hesitation about how much AI can effectively contribute without risking oversights or errors that could affect manuscript quality.

To address the growing challenges in China's peer review system, many scholars argue that the editorial process needs reform, with more responsibility taken by editors to filter submissions before sending them for review. Additionally, there is a call for better training for ECRs and a more equitable distribution of review requests across all levels of academia.

7.1.2 | Malaysia

ECRs in Malaysia engage in peer review as part of their academic duties, often reviewing for journals within their specific fields of expertise. Their level of involvement varies significantly based on conditions such as institutional expectations, research productivity, journal reputation and the availability of mentorship from senior academics. All Malaysian ECRs in this study reported participating in peer review and frequently addressing criticisms of either their own publications or those of their research group. ECRs who are active authors typically take on roles as peer reviewers; once they become corresponding authors, they often receive a substantial number of papers to review. One ECR (life scientist, having 46% publications on the Web of Science as corresponding author) reported having conducted 295 verified peer reviews on Publons, proudly noting that his average review time is just 5 days, a pace that is highly regarded by publishers such as MDPI, Springer and Elsevier.

While some ECRs are deeply involved in peer review, particularly for international journals, others may have fewer opportunities due to limited networks or the early stage of their careers. Despite these challenges, many ECRs, especially in the sciences, actively participate in peer review, viewing it as a mechanism that lends legitimacy to research and enhances its credibility. They engage in these activities even though peer reviewing is not formally incentivised and carries very low weight in key performance indicators (KPIs), making it a lower priority amid their other professional responsibilities. Since peer review contributions do not directly impact their KPIs and often go unrecognised in formal career assessments, they may be frequently sidelined, further discouraging active participation.

One of the major challenges Malaysian ECRs face is the lack of formal training in reviewing manuscripts. While universities do not provide structured training programmes, some ECRs reported attending workshops conducted by author services companies such as Enago, which aim to equip them with the necessary skills for peer review. However, none of the ECRs in this study reported having received formal peer review training; instead, they learn from the way their own papers are reviewed. This informal approach leaves many feeling uncertain about how to provide constructive and ethical feedback, which can impact both the quality of their reviews and their confidence in performing this essential academic task. Additionally, some ECRs still have doubts about the quality of their peer reviews due to their limited experience. Interestingly, none of the ECRs in this study reported using AI tools to assist in peer reviewing, viewing them as inappropriate and unnecessary for this task. Possible reasons for this could include concerns over the ethical implications of AI in academic review, or a preference for human judgment in evaluating research quality. This highlights that AI remains largely unexplored in the peer review process for Malaysian ECRs.

Malaysia is home to over 1000 national journals, the majority of which are published in English and prioritise double-blind peer review. Many of these are open access diamond journals. However, attracting qualified reviewers remains a significant challenge, especially for journals that are not indexed in prestigious citation databases, such as Web of Science and do not

have verified peer review services like Publons. To address this issue, it is essential to recognise peer review as a valuable academic service, which would encourage ECRs to engage more actively in this important task, particularly for national journals. Furthermore, adopting open peer review models, where feedback is transparent and reviewers' contributions are acknowledged, can provide ECRs with invaluable learning experiences. This exposure to the review processes of more experienced academics not only enhances ECRs' understanding of peer review but also fosters a sense of community. Such initiatives align with Malaysia's growing emphasis on open science and research transparency, creating meaningful opportunities for ECRs to actively participate in the academic community while balancing their broader academic responsibilities.

7.1.3 | Poland

In Poland, double blind review is generally used, and this form is liked by Polish respondents. The editors of Polish journals attach great importance to this anonymity and to the application of ethical principles, for example COPE.

In general, the Polish journals do not pay for reviews because they do not have resources. Sometimes, rarely, Polish journals obtain funds from the ministry and then can pay (small amounts) to reviewers. More often, Polish university publishers pay for book/monograph reviews, but these are not large amounts either.

Many Polish scientists are eager to take up reviewing in international reputable journals, as this comes with community recognition and visibility. Moreover, writing reviews is sometimes considered in the periodic evaluation of a university employees/researchers because some universities have a points-based staff appraisal system, and then you can get some (small) points for reviews. Perhaps this encourages some to review, certainly not all—mainly those who simply enjoy it or those who are seeking academic promotion, because reviewing in internationally recognised journals is welcomed.

Polish ECRs stressed that reviewing other people's texts teaches them a lot and helps them write their own. Some ECRs were already so experienced in preparing reviews for international journals that they complained about the excessive load of requests for reviews coming in each week. In contrast, senior research-teaching staff at Polish universities focus on writing reviews in doctoral, postdoctoral and professorial proceedings, as proceedings require the involvement of several reviewers.

ECRs point to a lack of formal training in reviewing. Some mentioned that they had used courses made available on the websites of international publishers, while others mentioned taking classes in this area in their doctoral studies, and still others mentioned help from senior professors.

Nevertheless, in Poland, as in other countries, the problem of an overabundance of scientific publications and an insufficient number of insightful and timely reviewers is felt. In the Polish scientific community, as in the rest of the world, discussions are

taking place on the role of AI in reviewing, as well as the responsibility of scientific editors in recognising texts with AI abuse.

7.1.4 | Portugal

Portuguese researchers recognise the importance of peer review to the credibility of scientific publishing. It is just part of the system. But the burden of so many peer review requests, among all the predatory and spam correspondence, together with low recognition in the performance assessment systems, puts in peril one of the central pillars of the traditional system.

Innovation is also in the minds of ECRs. A call for more transparency through public publishing of reviews is opening the doors to open peer review. AI could accelerate this process, learning and reading the sources of the state of the art, comparing new content with that already published and looking for causality between phenomena. Even if not replacing the current peer review system, as the Portuguese cohort is unable to forecast that possibility, AI could be part of it. One of the mentioned issues is science ethos: AI should be able to be totally impartial and avoid repeating the same patterns and standards, but to do exactly the opposite, favour disruptive research and disregard 'all-the-same' science. No one knows now how to do that and control the quality of science at the same time, but ECRs have thought about it. Is AI the last frontier of science publishing? Is AI able to acquire a complete knowledge of different areas of research, knowing how to apply the correct terms even when they are terms used in other fields, having an absolute knowledge of the state of the art, as well as the topics currently under discussion? Avoiding bias would enable a full AI potential in peer reviewing, showing how open-minded the Portuguese sample is. On the other hand, with or without AI, recognition and compensation of reviewers for their time should be mandatory. ECR want a paid service because it can be a lengthy and complex job.

A recent newspaper article in a national outlet by a Portuguese professor (Barral 2024) puts its finger on how things are in Portugal and places it in a wider scholarly communication context, so we are quoting it in some detail:

The number of scientific articles has been rising exponentially (currently, more than three million annually), which is also reflected in the enormous increase in the number of scientific journals. One frequent criticism, to which the impressive rise in the number of publications and journals cannot be indifferent is the disparity in the quality of reviews. Despite having guidelines, it is not easy to ensure consistently high-quality reviews. In fact, with so many articles, it is difficult to secure good reviewers and to ensure that they have the time and availability to review several articles per year with quality. Additionally, the work of reviewers is generally unpaid in most fields. As a result, journals often need to invite several reviewers to find someone available. This, in fact, is one of the tasks central to the "quiet

quitting” movement. Paying reviewers may help address this issue, but training, which currently does not formally exist, is essential to ensuring the quality of the process.

An indicator of the profitability of this business is the emergence of so-called ‘predatory’ journals, which exploit the market for almost purely profit-driven purposes, without acceptable standards for article review or quality assurance. It is not easy to correct this situation, as publishing scientific discoveries should continue to be encouraged, and the existing peer review system, far from perfect, ensures some fundamental scrutiny. However, since this system remains essential, it is imperative that measures are taken. The only solution is coordination between funding agencies from different countries, particularly those that invest most in science, as well as the European Commission, to negotiate with the main publishers. This is because these agencies provide much of the funding used to pay for publication costs. For these reasons, it is urgent to act and not leave everything as it is, at the mercy of the interests of publishers and predatory journals.

7.1.5 | Spain

Most reviews are requested from a minority of researchers: those with a certain reputation due to their publication record, or those who are more visible and well-known because they speak at conferences, and so on. This means that it is the established researchers with a medium or long career behind them who receive the greatest number of requests. The consequence is that they are overwhelmed; they reject a large part of the requests, or they do not spend enough time on the reviews they accept and, therefore, these do not have the desired quality. For prestigious researchers over 50–55 years of age, reviews contribute little to their reputation. They see them as a workload that they no longer see the point in taking on.

This is not the case for ECRs eager to conduct reviews and all the tasks that allow them to progress in their career. The strong point is that they will get involved in the work and make valuable contributions if the manuscript falls within their field. The weak point is that in their eagerness to obtain this merit, they may accept reviews of articles that are outside their field of knowledge and, therefore, that contribution is no longer so valuable. In general, they have not been trained formally for peer review, and they have missed it.

In the case of expert reviewers, in addition to the excess of articles that are requested of them, it is increasingly less motivating to see that the editors do not do their job properly. They do not carry out the prior filtering work and send manuscripts of very poor quality for review that they themselves should have rejected or returned to the authors for improvement of their writing, for example. Likewise, it is disheartening to see that when they

receive the reviews, they rarely study them and filter the opinions of the reviewers to the authors. In this way, the authors can find themselves with absurd requests from some reviewers—impossible to implement—or contradictory requests from the different reviewers—which the authors do not know how to harmonise.

The editors are not always very successful when it comes to choosing the reviewers either. Requests that are outside the reviewers’ field of specialty arrive too often. If we add to this the fact that review times have been shortened following the custom established by the new open access journals, the conclusion is that peer review is in a crisis. The solution lies in the hands of the editors who delegate too much to the reviewers and should take the reins of peer review again. They may need to strengthen their work teams, and there should be no impediment to doing so given the benefits that the publishing business brings with it. AI tools can also be helpful. They can serve as a first filter for the works and can also facilitate the best matching between manuscripts and reviewers.

The implementation of open peer review can also avoid reports from researchers who are not experts and, therefore, do not help authors to improve their manuscript. However, researchers usually prefer double-blind peer review because they are more comfortable with anonymity. ECRs like to be free to review other ‘important’ people’s work and for their own work to be judged without bias. Yet some of them are also for open peer review as researchers since it is good to know who their reviewers are. Transparency is increasing its relevance for researchers.

7.2 | Interview Results

7.2.1 | Experience as a Peer Reviewer

ECRs were asked whether they have done peer review themselves? This was mainly a simple yes/no/no response question, but 19 ECRs felt the need to explain or qualify their decision. We wanted to discover whether junior researchers are employed as peer reviewers, and it turns out that four out of five ECRs are, and that means most ECRs are a knowledgeable group who are experienced enough to be asked about peer review (Table 2). The only country where there were sizeable numbers of unexperienced reviewers is Poland, and these ECRs tend to be doctoral students who come from the arts and humanities, where there are few opportunities for peer review anyway.

The following quotes provide a flavour of the type of comments provided:

I continue to review more and more. I am also currently doing paid reviews. I am also a guest editor at one journal where I have experience working with reviewers. [Polish humanities ECR].

Publons, now has done 227 reviews. Reviewer reviews: my average review is 5 days; MDPI likes it that I can do fast. Same for Springer and Elsevier. [Malaysian life scientist].

TABLE 2 | Peer review experience by country.

	Total	CN	ES	GB	MY	PL	PT	US
No	18 (20%)	1	0	0	0	14	2	1
Yes	72 (79%)	21	10	3	10	18	8	2
N/A	1 (1%)	0	0	0	0	0	0	1
Total	91 (100%)	22	10	3	10	32	10	4

TABLE 3 | Responding to criticisms of their groups' publications?

	Total	CN	ES	GB	MY	PL	PT	US
No	11 (12%)	0	2	1	0	3	5	0
Yes	79 (87%)	21	8	2	10	29	5	4
N/A	1 (1%)	1	0	0	0	0	0	0
Total	91 (100%)	22	10	3	10	32	10	4

Once you become the corresponding author, you'll receive your fair share of papers to review. I've accumulated quite a bit of experience in peer review. [Malaysian chemist].

7.2.2 | Involvement in Responding to Criticisms of Their Groups' Publications?

We also wished to find out whether ECRs were involved in the other side of the peer review process, not just 'dishing it out', but receiving it from others. Again, this required a mainly a simple yes/no/no response, however, again 16 ECRs felt the need to comment. The vast majority of ECRs (87%) had, so a picture of very seasoned researchers is emerging (Table 3).

The comments volunteered were not generally substantial, but these were the more informative:

A Malaysian chemist pointed out that they just did it: for the papers that I am first or corresponding author.

A Polish humanities ECR said: While I have not yet been a reviewer of books or academic articles, I have responded to reviews of my writing—both articles and the book.

7.2.3 | Trust in the Validity of the Peer Review Process

The question asked: To what extent do they feel that the peer review system vouches for the quality and trustworthiness of formally published research? ECRs were required to provide a trustworthiness grade on a range of 1–5, with 5 being wholly trustworthy, and then to comment or justify their score. The question was then both quantitative and qualitative in nature, and the fact that ECRs supported their scores with justifications

gives the quantitative evidence more robustness. ECRs answered the question as authors, reviewers and readers.

It was a clear question and the grades and the answers seemed to demonstrate that this was indeed the case. It was also a question that seemed to touch a raw nerve and many researchers gave it long and considered thought. However, this was not necessarily the case with Chinese ECRs, where one-third of the cohort did not answer the question. The national interviewer put this down to the recent huge retraction of Chinese papers, which has become a sensitive topic, as it raises questions about the effectiveness of the peer review process. Discussions around this issue can be seen as taboo because they challenge the integrity and reliability of peer-reviewed research, which is foundational to academic credibility. As a result, some researchers hesitate to speak openly about the topic, fearing it could reflect poorly on their own work or the field as a whole. This reluctance can lead to a lack of constructive dialogue on improving the peer review system and addressing systemic issues.

It was clear that the question was not relevant to A&H ECRs from Poland because they do not publish in journals. Four said so, and most of the others graded it lowly.

Table 4 shows that, overall, there was more trust in the system than distrust in it, but with just 42% scoring the two highest bands of trust (4/5) and the majority opting for the middle ground 3 (29%), there were clearly concerns about it, although it would be true to say that few people thought it wholly untrustworthy. So damaged, but not bust might be the conclusion on peer review.

Portugal exhibits the highest trust in peer review, with 6/10 scoring 5. There is confidence in the system, namely the work of their peers. Trust in peer review can be assumed as a principle, but does not mean that current problems are ignored. In general, the level of trust reveals a commitment to the system's good practices.

TABLE 4 | Trust in peer review by country (1 = no trust; 5 = fully trust).

Country	1	2	3	4	5	N/A	Weighted average
China (22)	0	1	5	6	3	7	3.7
Malaysia (10)	0	0	0	6	0	4	4.0
Poland (31)	2	2	12	6	5	5	3.4
Portugal (10)	0	2	1	1	6	0	4.1
Spain (10)	0	2	4	4	0	0	3.2
UK (3)	0	0	1	0	1	1	4.0
US (4)	0	0	3	1	0		3.3
All (91)	2 (2%)	7 (8%)	26 (29%)	24 (26%)	15 (16%)	17 (19%)	

By contrast, Spanish ECRs were much more sceptical, with 60% scoring at 3 or below. It was felt by the national interviewer that ECRs are a generally worrisome cohort. While numerically more Polish ECRs rated in the 1–3 zone, this was inflated by their larger numbers and the presence of A&H ECRs among them, who did not always see the relevance of peer review. Four said they could not provide a score for that reason.

Looking first at the ECRs who exhibited the greatest trust in the system as defined by a score of 5. Nearly half came from Portugal. Interestingly, even some of the high-scoring ECRs had concerns about the system, such as this Portuguese environmental scientist, who worried about the greater demands on the system these days:

It seems to me that so far it has worked, and it is a fundamental part of the system, although it has many problems associated with it, mainly the number of publications that are currently required and the little time given to reviewers to review for journals to meet their targets and ‘profits’. I believe that sooner or later we will see a major change in this area.

A Chinese medical scientist pointed to the fact that peer review is better at the top of the tree:

I largely believe that the more high-quality a journal is, the more rigorous its peer review system tends to be.

This Portuguese mathematical scientist expressed no such concerns, for them peer review ticked all the boxes:

It promotes quality and scientific rigor; it helps detect errors and flaws in research methods; it helps validate work and obtain credibility; it is an important mechanism for obtaining constructive feedback, and it also helps detect bias.

This Chinese soft social scientist expressed want most people probably want from peer review:

To a large extent, the suggested revisions from peer review can greatly enhance the quality of the paper based on its initial draft.

Surprisingly, perhaps, there is this plaudit from an unexpected source—a Portuguese Arts and humanities ECR, who set down the criteria by which peer review can be measured:

Peer review is the fairest way of evaluating scientific production if—and only if—it meets the following criteria: Total anonymity of the reviewers and the author; Impartiality and honesty on the part of the reviewers; Serious and constructive comments on the part of the reviewers for the improvement and maturation of the original to be evaluated; Ideally, all articles would also be subject to plagiarism tests. However, there is still no software that is completely successful in this field, so phrases such as ‘in addition’ are often flagged as plagiarism.

Finally, this comment from a Chinese physical scientist, although scoring ‘just’ 4, is worth reproducing, as it points to the built-in flaw of the system, its subjectiveness:

70% of the extent. I have doubts about the fairness and impartiality of the peer review system. In evitably, due to different subjective awareness among experts, there will be different views on articles, which will lead to different results; however, the peer review system is the best now, and there is no current system that is more appropriate.

It is in the middle ground (scores of 3) where you find the ‘balanced’ people who say peer review is not very good, but what would you replace it with, or it is better that nothing, it is not what it seems, or at the very best provides a filter:

It's all there is now, and it may have bad points, but you don't have a choice. [Chinese physicist].

It do not vouch for quality but it is a good filter [Spanish physicist].

It may be reliable, but it may also not be, because many times we receive reviews on a topic that are not 100% known by the assigned reviewers [Spanish mathematical scientist].

What then do the ECRs who question the trustworthiness of peer review say? That is the 10% of ECRs who scored either a 1 or 2.

This Polish life scientist was, perhaps, the most damning, stating that the problem is down to the increasing time pressures on the reviewer:

The kind of thinking that peer review is a guarantee of quality has collapsed a bit, and this has been done by a huge reduction in the time to do reviews. I have found publications in my discipline that I, as a reviewer, would have taken back. The reviewer has not fulfilled his or her role. But I am aware that it is difficult to perform an integrity review. I only respond positively to a dozen invitations a week once or twice a month.

This problem is mentioned, too, by a Portuguese life scientist:

Less and less because the reviewers do not have time to do it calmly.

A Polish Humanities ECR points to unethical behaviour associated with selecting peer reviewers.

In my opinion, it does not warrant it at all. From my own background, I know of a case that received good reviews from close friends of the author but turned out to be a scientific bubble.

Here is a Spanish chemical scientist who is disgruntled because of poor reviewers:

I don't have much confidence in peer review processes. I have come across fantastic posts reviewed by inexperienced people and vice versa. Deep down I think that, on many occasions, it is a matter of luck (and it is sad to think this).

Most of the problems were put down to time pressures and inadequate or unknowledgeable reviewers, but there were more worrisome than that, for instance:

Yes, but it is broken and he does not know how to fix it. Last week he had the experience of a reviewer wanting him to cite two irrelevant papers. Not ethical. The editor has not done his job. In one case,

he wanted AA to meet the referee. Not the point [US physicist].

7.2.4 | Improving Peer Review

While we have already heard about possible improvements to peer review in the previous question, it was followed by a question that specifically asked about it: Do they feel that the peer review system needs improving in any way? This was also a question they could answer quantitatively and qualitatively and, in the case of the former, by a yes, no, or do not know.

Two-thirds of ECRs thought the system could be improved and just 14% thought not (Table 5). A relatively high figure (21%) either did not know, did not really care (A&H ECRs), or did not want to divulge an opinion (e.g., Chinese ECRs). Thus, a large majority of ECRs wish to see change.

All Spanish ECRs thought the system could be improved and provided suggestions as to how. Poland had the most ECRs saying it could not be improved, but this figure was inflated by its large A&H cohort to whom peer review was not important. Also, the one ECR who prevented Portugal obtaining a 100% yes score was an A&H ECR. Given the black cloud that hangs over peer review in China, one might have thought that more ECRs would have volunteered improvements, but that was not the case.

So, what were the main improvements suggested? Well, anonymity/double-blind reviewing topped the list with 22 ECRs saying so. Some way back came better matching/selecting interviewers and paying reviewers, both receiving support from 10 ECRs. Naming reviewers obtained some support with six ECRs. Then came faster reviews and open peer review, both with three ECRs. Other suggestions included: Evaluating reviewers, training for reviewers, use of more ECRs, using AI and tighter editorial control.

This is what a double-blind advocate said:

In my opinion, anonymity is better for reviewing than openness. I would be concerned about personal motives, for example, jealousy on the one hand or

TABLE 5 | Could peer review be improved?

Country	Yes	No	N/A
China (22)	11 (50%)	3 (14%)	8 (36%)
Malaysia (10)	5 (50%)	0	5 (50%)
Poland (32)	20 (63%)	9 (28%)	3 (9%)
Portugal (10)	9 (90%)	1 (10%)	0
Spain (10)	10 (100%)	0	0
UK (3)	2 (66%)	0	1 (34%)
US (4)	2 (50%)	0	2 (50%)
All (91)	59 (65%)	13 (14%)	19 (21%)

indulgence on the other. I still remember from my thesis days at university that the supervisor chose reviewers with whom he had a good interpersonal relationship. In science, therefore, it is better not to reveal the names of authors and reviewers. [Polish humanities ECR].

A Chinese medical scientist spoke on (the mess of) finding and matching reviewers:

There's a big problem with finding reviewers; many people don't like to review, and it's a pain in the ass to find reviewers; the system of recommending reviewers is confusing; reviewers don't match up, and the reviewer may not even understand the article content. There are journals that let you recommend reviewers; some journals will use them, some journals won't use them, but each of them will ask you to recommend. Sometimes the journal doesn't quite believe in the recommended reviewers after using them, and then conducts the next round of peer review, which I feel is quite a waste of time, and I have come across an article (which used a recommended reviewer) that went through three rounds of reviewing.

A Malaysian soft social scientist on payment:

Must have an incentive so that reviewers can do their work faster! If you think back, reviewing work is free; the best you can get is free access to journals for 2–3 months. Honestly??

This, telling comment from a Portuguese humanities ECR wanting less power for reviewers (something that other ECRs might have thought but never said):

Yes, I am concerned that reviewers 'impose' the methodologies they like best and 'force' authors to make significant changes to their articles if they want to publish them. It is not about their quality, but about the imposition of the power of the reviewer

and their preferences, which reduces the diversity of scientific publication and always replicates the same methodologies, acting against the innovation and disruption that science should be.

And, finally, from a Spanish medical scientist on their wish for stronger editorial input:

The editorial process should be stricter and only send for review what is worth it.

7.2.5 | Choosing What to Read and Importance of Peer Review

This question concerned ECRs as readers and it formed an option in a broader question about what factors they consider when choosing to read a paper. It asked: When they have searched and found an article on a topic important to their research, what criterion persuades them to read it: [On a scale of 0 as no importance to 5 as very high importance ask interviewee to rate these characteristics]: the type of peer review process, which the article has undergone.

Well over half (55%) of ECRs rated the type of peer review as an important or very important factor (Table 6). It was the Chinese who, once again, were out of step with only a quarter saying it was an important criterion. Again, the Polish A&H ECRs did not see this as a relevant factor, with 10 of them scoring 2 or fewer.

7.2.6 | Peer Review and AI

The question asked was: What do you think an AI-based peer review should be capable of doing if it is to replace the current system? AI matters, of course, have been mentioned in previous questions, but here we zeroed in on it.

The majority view was that AI will have an impact and that it would be beneficial (45/91; 49%), but few ECRs—although there were some—thought it would totally replace the current system. Rather, it was more a case of AI improving/complementing the existing process. Regarding what aspects of peer review could be improved, four that stood out: (1) identifying plagiarism and

TABLE 6 | Type of peer review as a factor in deciding to read a paper.

Scale	Total ECRs	CN	ES	GB	MY	PL	PT	US
0	8 (9%)	6	2	0	0	0	0	0
1	7 (8%)	1	0	0	0	4	1	1
2	7 (8%)	1	0	0	0	6	0	0
3	15 (16%)	7	0	0	2	5	1	0
4	19 (21%)	3	3	0	5	3	4	1
5	31 (34%)	3	5	1	3	14	4	1
N/A	4 (4%)	1	0	2	0	0	0	1
Total	91 (100%)	22	10	3	10	32	10	4

establishing novelty (12); (2) saving time/speeding up the peer review process, which we have seen is something ECRs want (12); (3) helping better match reviewers (7); (4) assessing the quality/appropriateness of reviewers (4). Additionally, a further three researchers said AI would be a better reviewer altogether, avoiding bias, for instance. As we have heard, the Portuguese and the Malaysians were especially positive about the changes AI could make to peer review.

Just 12 (13%) ECRs thought there would be an impact, but that this would be negative. Polish A&H ECRs dominated this category. A further six (7%) said there would be no impact at all, so only a very small percentage. The Chinese dominated this category. Fourteen (15%) ECRs did not know or were not sure. Typically, because they were not informed or experienced enough to say, Polish A&H ECRs dominated this category.

7.2.6.1 | Examples of ECRs Saying AI Will Have a Positive Impact.

Yes. It is difficult to guarantee the authenticity of the data when writing an article using artificial intelligence. In addition, it is difficult to determine whether the ideas and findings in the study are presented by the author himself or herself [Chinese medical scientist, who appears to be setting AI on AI].

First, reviewers can use artificial intelligence technology to assist with the review process, making it more accurate in terms of understanding research results and their innovation. Additionally, AI technology can be used to match reviewers with research results. I think these changes have positive significance. [Chinese soft social scientist, highlighting better matching of reviewers with content].

AI can be used to calculate the pass rate of peer reviewers and analyse the types of articles they approve or reject to create an algorithm to measure the level of expertise of peer reviewers. [Chinese medic seeing the benefits of assessing reviewers].

For AI to take over the current peer-review system, it needs to be fair, unbiased, and ensure the reviews are high quality, keeping scientific publications up to high standards. With AI, there might not be a need for high APC, showcasing cost-effectiveness and potentially lessening the financial burden linked to the current peer-review system. [Malaysian mathematical scientist, who saw financial benefits accruing].

Then, there is this from a Portuguese chemist, which sees the benefits together with the downsides:

As it is a very time-consuming process, unpaid and requiring high levels of qualification, quality is

totally dependent on the ethics and integrity of the reviewing researchers. With few incentives (ethics and integrity), IA will have (or already has?) an important role, although I don't think it can reproduce a human review in which each reviewer has different perspectives, experiences and opinions and whose suggestions contribute to improving publications from various points of view.

7.2.6.2 | An Example of Those Saying There Would Be No Impact.

Not in my field. I think it helps to write an article and solve programming errors, but it is still not capable of inventing a model that does not exist, programming it, and making it work. [Spanish mathematical scientist].

7.2.6.3 | Example Saying There Would Be a Negative Impact.

AI better not replace humans in reviewing; it will only exacerbate existing problems, as AI has a bias because it learns from a base that is very homogeneous and not necessarily based on merit, and certainly not socially sensitive. The nuance will slip away. [Polish A&H ECR].

Research is a frontier of knowledge and, as such, it is current, not past knowledge on which AI algorithms are based. Also, it would not be desirable because all reviews would follow the same model and all articles would go in the same direction. It is dangerous [Spanish hard social scientist].

7.2.7 | Other Questions Where Peer Review Was Mentioned

A keyword search of the entire interview database showed peer review cropped up 49 times in an additional 17 questions, showing how pervasive it is and that it cannot be contained by just direct questions. The questions obtaining three or more mentions are listed in descending order of mentions in Table 7. For the top three questions, illustrative supporting quotes are provided.

The top question about preprints created so many peer review mentions because ECRs were pointing out that they were not peer reviewed (although not all ECRs knew this) and that limited their use and citing behaviour. This Chinese mathematical scientist provides a full and thoughtful response:

Firstly, preprints and peer review are still crucial, as preprints currently don't generate much impact. To be precise, unless it's very early and highly impactful

TABLE 7 | Non-peer review questions obtaining the most peer review mentions.

Question	Number of mentions
Do they consider a preprint to be: (a) an alternative to; (b) a replacement for a traditional publication?	12
How do they view AI?	10
Do they believe that the AI-associated potential for rapid production of low-quality scientific articles brings about a decline in the overall quality of research output and rise of predatory journals and papermills?	7
What is the extent of their AI use or engagement?	3
Do they think more informal modes of communication will play a larger role?	3
Others (12 Qs)	12

work, most people choose to submit to specific conferences or journals, undergo peer review, and transform their work into a finished product or an acknowledged contribution. If preprints were to replace traditional publications without any peer review process, given that preprints have no threshold, it would create a different value system. Chinese mathematical scientist.

Nevertheless, a Spanish environmental scientist pointed out that preprints have their role:

The preprint can help you improve your work thanks to the support of the community, and above all it makes visible studies that have not yet gone through the traditional peer review process, so that you can ‘count’ it as a publication... But I think it is expected that it will finally be published in a journal.

The second most mentioned question was a general question on their attitudes towards AI. Quite a few of these were criticisms of using AI for peer review purposes, like this one from a Chinese soft social scientist: I do not trust the information provided by AI and prefer to find out by myself. And I dislike the behaviour of using AI for peer review.

Another Chinese ECR, a physical scientist, pointed out how AI might ‘con’ the traditional peer review system.

After the popularity of ChatGPT, everyone uses it to write or revise papers, but my point is that you can use ChatGPT to polish a paper, but you can’t exactly use it to write a paper. But there is another problem, ChatGPT’s polish function is powerful, which can make a poor-quality paper look good. If the peer

reviewer is not serious and does not consider the idea and approach of the paper, but only judges by the language, then it may cause confusion.

If we add in Q4 in the list, which is also a general question about AI, not about scholarly communications as the others, we can see that 15 comments volunteered peer review outside the scholarly communication context showing how important it is.

The third question about the possibility of AI generating a wave of low-quality material brought a ragtag selection of comments generally agreeing with the question, such as this one from a Malaysian soft scientist:

Predatory journals might jump on AI-generated content because they can publish articles without bothering much with proper peer review. So, these journals might not check thoroughly because AI articles might miss that human touch, making them perfect for these journals trying to boost their publication numbers.

And, finally, this from a Portuguese mathematical scientist: As long as the peer review processes are carried out by experts, I do not see this possibility becoming very visible. The question is whether, in the future, peer review itself will also be partially carried out by AI.

8 | Conclusions

Presented here is an uncommonly deep and personal dive into peer review and recounted much in the very own words of ECRs in order to get the points home and in a fresh and unfiltered form. The voices of nearly 100 international and multi-disciplinary researchers are compelling and should be heard.

In terms of peer review, ECRs proved to be a highly experienced cohort, with well over three quarters conducting peer review and an even higher proportion active in responding to reviewers’ comments. This supports our long-held view that ECRs might be junior in status, but they are certainly not junior in the work they do. They are a peer review voice very worth hearing and encouraging.

There is more trust in peer review than distrust in it, but there are clearly concerns with it, and ECRs are very vocal about it, although few thought it completely untrustworthy. The general belief is that it does an essential job but needs improving and updating.

Peer review is clearly something that arts and humanities ECRs are not familiar with or much concerned about, and this is for obvious reasons—they tend not to publish in journals, or in some cases, not at all.

No surprise, then, that a sizeable majority (two-thirds) of ECRs thought peer review could be improved and only a small

proportion (14%) thought not. More than a dozen different suggestions were made, with anonymity/double-blind reviewing topping the wish list. Better matching/selecting of interviewers, paying reviewers, and naming them also recorded some interest. Quality of review and not speed is the main concern.

Well over half of ECRs rated the type of peer review a paper has been subject to as an important or very important factor when judging whether to read it or not.

In terms of AI, the majority view was that it will have an impact on peer review—transformative perhaps—and that it would be beneficial, but few ECRs thought it would totally replace the current human system. The aspects of peer review that would be improved were thought, unsurprisingly, to be: (1) in identifying plagiarism and establishing novelty; (2) saving time/speeding up the peer review process; (3) improving the matching of reviewers with content; (4) assessing the quality/appropriateness of reviewers (reviewing the reviewers). All things, which in principle are doable.

Peer review cropped up in 17 questions that did not ask about it, showing how pervasive it is in scholarly communications. The questions which generated the most mentions were those asking about preprints and a general question about how they viewed AI.

Regarding change, since the last Harbingers study not much has changed in the intervening two years, apart from the fact that now AI is seen by most ECRs to be the harbinger of beneficial change. ECRs expect change.

Note this was a preliminary study, part of the long-running, longitudinal Harbingers project, attempting to inform and plan for a major study, which would have a larger and more representative cohort of ECRs. Our findings should be treated with caution, more as informed observations, filling a knowledge vacuum.

Author Contributions

Nicholas provided oversight of the article and wrote much of it. Świgoń undertook the A&H element. Clark provided the data analysis, technical support and insights. Herman did the literature review. The rest of the authors undertook their country analyses and provided general feedback on the paper.

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Consent

Participants who freely opted to take part in the interviews were asked to provide their names and contact details for follow-up questions regarding the accuracy of the interview transcripts, but access to all personal data was restricted to the investigating team and was removed before the analysis of the results.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Endnotes

¹ <http://ciber-research.com/harbingers.html>.

² <http://ciber-research.com/harbingers-2/>.

³ Although by the third, current stage of the project there are more participants in their forties because our cohort has aged.

⁴ Note though, that the institutional evaluation of Arts and Humanities contributions to knowledge, whilst considered no less important than in Sciences and Social Sciences, relies on alternative conventions: on familiarity and openness, and on different objects of evaluations (monograph figures highest). Indeed, the monograph, which is the predominant form of publication in the Humanities, is not always subjected to a peer review. (Cassella 2010; Verbergt and Hagen 2024).

⁵ Poland. National Science Centre no. 2022/45/B/HS2/00041.

⁶ https://ciber-research.uk/download/ECRs_Harbingers%203_Pilot%20Interview_schedule_1610DN.pdf.

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