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Original Article

Balancing principles and practices: Disciplinary differences in Croatian researchers' attitudes to open-access publishing

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The data that support the findings of this study are available upon request from the corresponding author.

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Abstract

Background: Researchers' attitudes to, and use of, open-access publishing are shaped by many factors, including the characteristics of scientific disciplines – whether STEM (Science, Technology, Engineering, and Medicine) or SSH (Social Sciences and Humanities) – and various micro-characteristics of the environment in which the researchers operate.

Objectives: To analyse the attitudes of Croatian authors to open-access (OA) publishing and to explore disciplinary differences between researchers in STEM and those in SSH.

Methods: Croatian researchers from both groups – STEM and SSH – were surveyed at the beginning of 2023. The online survey comprised 18 questions covering general attitudes towards OA, OA publishing models, the pay-to-publish option, and the criteria for choosing publication outlets.

Results: Out of 1042 researchers who responded to the survey, the analysis focused on the 763 (a response rate of about 5%) who fully completed the questionnaire. The majority of respondents expressed support for OA publishing and believed that it was beneficial to research and education. However, their attitudes towards specific benefits and shortcomings of OA publishing showed significant disciplinary differences: researchers in SSH were more convinced that OA enables timely distribution of new knowledge and makes it more visible, whereas researchers in STEM were more concerned about the impact of OA on the further commercialization of scientific publishing and about questionable peer review standards often associated with OA. In selecting a journal for publication, the respondents were motivated primarily by the journal's reputation. However, researchers in STEM tended to prioritize the journal's quantitative metrics, whereas researchers in SSH considered such practical aspects as the time taken by a journal to publish and its acceptance rate to be more important. Differences between the two categories of researchers in their attitudes towards publishing in exclusively pay-to-publish journals were statistically significant: researchers in STEM were more receptive to that model whereas those in SSH were opposed to publication fees or article processing charges, even if they were paid not by authors themselves but by their employers, funders, or other entities.

Conclusion: Researchers in STEM and those in SSH did not differ significantly in their general attitude towards OA publishing. The differences, when present, stemmed partly from the characteristics of scientific disciplines and partly from differences in the criteria for promotions. Researchers in STEM published significantly more often in international pay-to-publish OA journals, whereas researchers in SSH published significantly more often in national diamond OA journals. Continued state financial support to national diamond OA journals, together with making available more funds to publish in international OA journals, will be crucial to maintaining the current level of OA publishing in Croatia.

Keywords:

Authors' attitudes, Croatia, open access, publishing practices, PUBMET conference, scholarly communication, SSH, STEM

Introduction

Over the past decades, driven by advances in technology and increasing demands from academics, the movement for open access (OA) and open science (OS) has brought a paradigm shift in sharing academic knowledge, transforming scholarly communication. This transformation, along with the evolution of OA publishing models and the factors influencing academics' attitudes to, and use of, OA publishing, has been extensively examined in the literature.[1-6] However, any comprehensive discussion of OA publishing requires an in-depth analysis of its drivers and the barriers it faces across diverse geopolitical and disciplinary settings;[7] although several studies have addressed the specifics of particular regions or countries, each new case study enriches our understanding of the factors shaping OA publishing.[1,4,8,9]

Open-access publishing is intrinsically linked not only to specific characteristics of different scientific disciplines and the traditions and habits that influence the dissemination of research findings, but also to the larger environment in which authors and journals operate. The authors' awareness of the benefits of OA publishing and financial support for it are not the only factors at play: other micro-characteristics, such as the requirements for academic promotion, mandates imposed by institutions and regulatory bodies, advocacy efforts, and the criteria for evaluating OA publishing, can play a crucial role.[7]

Some of the key advantages of OA for researchers and their institutions are increased accessibility of published research and wider dissemination of scientific work. Guided by these benefits, many countries established suitable infrastructure to provide free and unrestricted access to their local journals by adopting the Diamond-OA publication model, which ensures that neither authors nor readers are charged any fees.[10]

Open access in Croatia

In the European context, OA publishing has been part of the academic agenda since 2006, and the Lisbon Treaty (2007) clearly emphasized the European Union's commitment to OA publishing. Croatia took the first steps towards OA even earlier. A group of librarians and information specialists from academic and research libraries pioneered the OA movement in Croatia. They organized many activities advocating OA and promoting its benefits. In collaboration with the University of Zagreb Computing Center, the group developed Hrčak, a central portal offering a free outlet for electronic publishing to predominantly non-profit Croatian scientific and professional journals, enhancing their reach across the scientific community.[11] Hrčak was introduced in 2006 and has been supported by the Croatian Ministry of Science and Technology ever since. This is the reason why the majority of Croatian scientific journals are OA. Out of 163 Croatian journals currently listed in the Directory of Open Access Journals (DOAJ), 150 employ the Diamond OA model. Notably, almost 60% of these journals fall within the category of social sciences and humanities (SSH). By way of comparison, Finland has 64 journals registered in the DOAJ, with 57 of them publishing without fees; Slovakia has 52 journals in the DOAJ, with 42 of them publishing free of charge; and Bulgaria has 95 journals in the DOAJ, with only 54 publishing without fees. Although the Croatian Declaration on OA was published in 2012,[12] the country is yet to adopt any official national OA strategy. Nevertheless, Croatia follows EU recommendations and guidelines with regard to its OA activities, and many public educational and research institutions are involved in European projects addressing issues related to OS.

In addition to supporting printed and electronic publishing of non-profit scientific and professional journals, Croatian authorities endorse the development of open research infrastructure, such as Dabar (Digital Academic Archives and Repositories), HR-ZOO (Croatian Scientific and Academic Cloud), and Croatian Research Information System. Furthermore, the regulations of the Croatian Science Foundation, adopted in July 2024, require grant recipients to ensure that their research outputs are OA. This can be achieved by publishing in OA journals (with publication fees paid out of the allocated budget) or by archiving the final version of manuscripts in institutional repositories.[13]

Integration of OS principles into the criteria for the accreditation or reaccreditation of academic institutions can be considered the next important step in Croatian OA efforts. The quality standards defined in a document published in 2023 assess an institution's commitment to OS based on the percentage of publications by its staff available in OA, maintenance and use of institutional repositories, and other measures promoting OA and transparency in scientific research.[14]

Selection of publishing outlet

The culture of a scientific discipline and its norms and traditions strongly impact the communication practices of researchers working in that discipline, including their relative reliance on journals, books, and conference proceedings.[15,16] This is also evident in the adoption and prevalence of OA publishing. Severin and co-authors synthesized relevant bibliometric studies that assessed the prevalence of OA and publishing patterns across disciplines and studied sociotechnical forces that shape OA publishing practices.[17] Natural, medical, and technical sciences show the highest prevalence of OA among those disciplines, with journal articles, resulting from grant-funded research, as the main communication format, whereas OA is the less-favoured option by researchers in disciplines under SSH; these researchers favour monographs as the main outlet for publishing and career advancement and are more concerned about quality control and funding issues.

Selection of a publishing outlet is often governed by the requirements of career advancement, which, in Croatia, is regulated nationally, although the criteria for promotion differ across academic disciplines.[18] In the fields of sciences, biomedicine, and health, researchers are required to publish in journals indexed by the Web of Science Core Collection or Scopus, specifically those ranked in the first or second quartile (Q1/Q2) according to Journal Citation Reports (JCR) or SCImago Journal Rank (SJR). For researchers in engineering and technology, the number of required publications in Q1/Q2 journals is smaller, and conference papers are also considered. In social sciences, papers can be published in journals falling in any of the four JCR or SJR quartiles, and publications in journals indexed by bibliographic databases other than Web of Science (WoS) and Scopus are also acceptable. Books, chapters in books, and doctoral theses are also considered in SSH. Furthermore, researchers in social sciences have to publish a part of their work in Croatian, and at least for some of those publications, the candidates must be the sole authors: papers with more than three co-authors earn fewer points. In the humanities, evaluations primarily emphasize books and papers published in national journals, with at least 25% of the required points coming from works published in Croatian.

The results of the first study exploring factors affecting OA publishing by Croatian researchers were published in 2009.[19] That cross-disciplinary survey included 170 respondents, half of them active in SSH. The most common

reason for publishing in OA journals (chosen by 55% of the respondents) was support for free access to scientific information, but the analysis showed that 24% of the respondents did not know whether the journals they published in were OA journals. Many changes have occurred since, including the increased share of Croatian OA papers and the strengthening of the national OA infrastructure with a network of interoperable institutional repositories. Moreover, our research conducted in 2023 indicated interesting differences in OA practices across scientific disciplines.[20]

Therefore, this paper aimed to analyse the current attitudes of Croatian authors towards OA publishing and to examine potential differences between researchers in STEM (Science, Technology, Engineering, and Medicine) and SSH. The focus is on general perceptions of OA, preference to publish in international versus local journals, OA status and financial considerations, factors influencing journal selection, willingness to adopt the 'pay-to-publish' model, and the extent of control over decisions related to the publishing outlet and the publishing model (diamond OA, pay-to-publish, and so on).

Methods

Data were collected through an online survey (in Croatian) conducted in February 2023. The questionnaire and part of the results were previously published in Croatian.[21] An English translation of the questionnaire is available as Supplement 1.

Participants

The survey was distributed via the former *Znanstvenici.hr* mailing list, which included researchers affiliated to Croatian universities and public research institutes, as well as PhD students, postdoctoral researchers, and librarians. The list had approximately 15,000 subscribers, but while the survey was open, the exact number of active email IDs was not known.

Questionnaire

The survey questionnaire comprised a total of 18 questions divided into three groups. The first group encompassed questions about the respondent's academic status, main area of expertise, and general attitude towards OA. The second group, intended for authors publishing predominantly in journals, was focused on journal publishing models. Questions in the third group were about the criteria for choosing journals for publication, payment of article processing charges (APCs), and using alternative models of OA. Responses to four questions assessing attitudes were recorded using a 5-point Likert scale, ranging from 1, Strongly disagree to 5, Strongly agree.

To explore disciplinary differences in Croatian researchers' attitudes to, and use of, OA, a variable, namely 'Research Areas', was created from the original dataset. Responses from authors in interdisciplinary fields (defined by Croatian regulations as a single scientific field consisting of different scientific fields, for example, security and defence, education sciences, and cognitive science), and those not providing data on research areas, were excluded from the analysis. The remaining participants were placed into one of the two categories, namely STEM or SSH.

The questionnaire was not validated, and only completed surveys were taken into account.

Statistical analyses

Statistical analyses were conducted using R (version 4.3.1),[22] and the Tidyverse package was used for data manipulation.[23] ReflexR was used for descriptive statistics; principal component analysis was carried out using Kaiser-Guttman criteria and oblimin oblique rotation for the assessment of the structure of questionnaires; Cronbach's alpha was used for reliability

analysis; t-tests with Cohen's D effect size were used for the analysis of differences; Fisher's exact test was used for 2 × 2 contingency tables;[24] and the Shapiro–Wilk test was used for testing the normality of distributions, (the criterion of skewness was taken as less than three and of kurtosis, less than seven).[25] In cases where these assumptions were violated, the Mann–Whitney test was used as a non-parametric alternative to the t-test.

Ethics

This study adhered to the principles of ethical research, ensuring informed consent, anonymity, and voluntary participation. Participants were provided with information on research objectives, no sensitive personal data were collected, and respondents could withdraw at any time. The confidentiality and security of collected data were ensured according to General Data Protection Regulation and other relevant data protection laws. The authors' institution's Ethics Committee exempted this study from the ethical approval process, in accordance with its guidelines regarding the evaluation of social research (SP-3108/1-2025).

Results and Discussion

Of the 1042 survey respondents, 763 completed the questionnaire in full (a response rate of about 5%). To explore the differences between the two categories, namely STEM and SSH, the analysis focused on 714 respondents: 471 (66%) from STEM and 243 (34%) from SSH, excluding 49 respondents from interdisciplinary fields (Table 1). All these respondents shared their overall attitude towards OA and their views on who should determine where and how research findings should be published. A vast majority (84%; 601 participants) reported that they primarily publish their research findings as journal articles. This preference was more pronounced among respondents representing STEM (92%; 435 participants) than among those representing SSH (68%; 166 participants). Those who primarily publish in journals were also asked additional, targeted questions on the journals' publishing practices.

General attitude towards open access

The majority of respondents expressed support for OA publishing and acknowledged its benefits, but attitudes towards specific benefits and shortcomings of OA publishing varied significantly. Whereas SSH authors were more convinced that OA enables timely distribution of new knowledge, improving its visibility and widening its reach and advancing scientific research, education, and public good, STEM authors were more concerned about the impact of OA publishing on the further commercialization of scientific publishing, the overwhelming volume of published information, and questionable peer-review standards.

The questions regarding the attitude towards OA were analysed using principal component analysis, which yielded a single-factor solution with an eigenvalue of 2.86 (explaining 47.7% of the variance). The total score

Table 1. Characteristics of the survey respondents

	STEM[1]		SSH[2]		Inter-disciplinary		
Variable	**n**	**%**	**n**	**%**	**n**	**%**	**Total**
Number of respondents	505	48.5	270	25.9	267	25.6	1042
Number of completed questionnaires	471	61.7	243	31.8	49	6.4	763
Number of respondents primarily publishing in journals	435	68.0	166	25.9	39	6.1	640

[1]Science, technology, engineering, and medicine.
[2]Social sciences and humanities.

was calculated as the sum of answers to the questions, thus having a total range of 6–30 with a theoretical mean of 18, and a higher score indicated a more positive attitude towards OA. The Cronbach alpha reliability of this scale was 0.770, and the two categories of respondents differed significantly in their responses (Table 2).

The results show a moderate-to-high effect size, with respondents from SSH reporting a more positive overall attitude towards OA than that reported by respondents from STEM.

Figure 1 shows the results of the analysis of answers to OA-specific questions as well as answers to the questions on four components of the usefulness of OA (scientific research, education, private sector, and public good). Data analysis is available in Supplement 2.

Comparing the results of the 2009 survey[19] with those of the present study, it is evident that Croatian researchers consistently support OA publishing. However, in 2009, many respondents had limited knowledge of OA publishing and associated it with lower citation impact, lower article quality, and a poor reputation of OA journals. Today, Croatian researchers are even more aware of both the benefits and challenges of OA.

These results differ from most published international studies and indicate a pattern specific to Croatia. The positive attitude of SSH researchers expressed in this survey aligns with our earlier findings, which showed that the prevalence of Croatian OA papers is the highest in the humanities (80%), followed by those in the social sciences (71%).[20] This can partly be explained by the large number of Croatian Diamond OA SSH journals.

Between 2021 and 2022, 87% of journal articles indexed in Scopus were in STEM, with 48% of these marked as OA. During the same period, out of 18% Scopus indexed articles belonging to SSH, 40% of papers were published as OA. Once again, authors affiliated to Croatian institutions demonstrated a unique trend: during 2021 and 2022, the share of OA papers in both STEM and SSH was equal, at 65%.

Publishing in international and local journals: open access and financial considerations

During 2021 and 2022, STEM authors on average published 1.1 papers in local journals (median = 0; Q1 = 0; Q3 = 2) and 5.5 papers in international journals (median = 4; Q1 = 2; Q3 = 7). At the same time, SSH authors published on average 2.1 papers in local journals (median = 2; Q1 = 1; Q3 = 3) and 2.6 papers in international journals (median = 2; Q1 = 1; Q3 = 3). There was a significant difference between publishing in local journals ($W = 21426$; $P < .001$) and in international journals ($W = 53408$; $P < .001$). This reflects Croatian criteria for academic promotion that encourage researchers in the humanities and social sciences to publish in Croatian. Additionally, these fields prioritize individual contributions, limiting the number of co-authors to three per paper. In contrast, STEM fields emphasize productivity, journal impact, and international reach with particular focus on Q1 and Q2 journals as ranked by JCR or SJR. These criteria frequently discourage Croatian STEM authors from publishing in

Table 2. Differences between respondents from STEM and SSH in their attitude towards open access

Variable	Group	n	M	Standard deviation	*t*-statistic	*P*	Cohen's D effect size
Attitude towards open access	SSH[1]	243	22.04	3.72	−8.46	<.001	−0.65
	STEM[2]	471	19.42	4.27			

[1]Social sciences and humanities.
[2]Science, technology, engineering, and medicine.

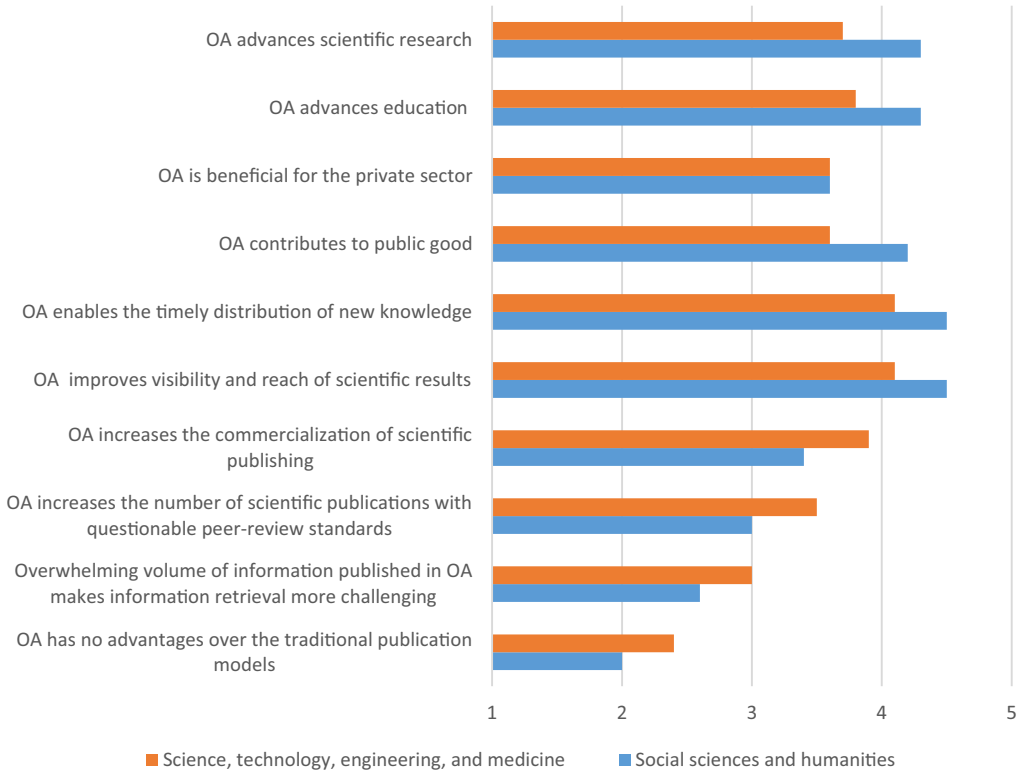

Figure 1. Average scores for attitudes to open access by participants from STEM and SSH. Note: The responses are the scores assigned on a 1-to-5 Likert scale, ranging from 1, Strongly disagree to 5, Strongly agree.

national journals, because JCR or SJR bibliometric indicators of many Croatian journals are unsatisfactory. On the other hand, Liu and Li showed that 49% of papers by Croatian authors covered by the WoS Social Sciences Citation Index over the period 2001–2015 were published in Croatian.[26]

Respondents from the two categories, STEM and SSH, did not differ significantly in the frequency of publishing in subscription-based national ($P = .380$) and international ($P = .061$) journals (with or without archiving the paper in an OA repository). Only a small proportion (up to 16%) of authors from both SSH and STEM fields used the option to self-archive their papers published in subscription-based journals into OA institutional repositories (data available in Supplement 2). According to the results of the recently published study by Golenko et al.,[27] even fewer respondents (11%) archived their articles in institutional or national repositories. Although the national OA infrastructure has developed significantly in the last decades, the rate of self-archiving has not increased. This highlights the need for continued efforts to promote the Green route to OA as an affordable and sustainable alternative to APC-based publishing practices.

Respondents in SSH were significantly more likely than those in STEM to publish in Diamond OA journals, both national (SSH, 84%; STEM, 67%; exact $P < .01$) and international (SSH, 47%; STEM, 18%; exact $P < .001$). Generally, many Diamond OA journals publish in local languages and have a local scope, and academic publishing in Croatian is no exception. The journals reach limited audiences but foster local engagement and promote the social relevance of SSH research. By addressing fields such as language, history, philosophy, law, and demography, these journals contribute to shaping national identity.

Despite limited international recognition, national authorities have compelling reasons to keep supporting their publication and mandate their Diamond OA status. This is the case not only in Croatia; similar support for national SSH journals can be found in other European countries as well.[28] The findings of Simard and co-authors also illustrate how Diamond OA journals may serve as publishing outlets for more geographically and linguistically diverse research communities globally.[29]

Respondents from STEM published significantly more papers in international journals that use the APC financing model than their SSH counterparts did. STEM respondents reported that they are more likely to pay APCs for OA journals, both Gold OA (SSH, 21%; STEM, 59%; exact $P < .001$) and Hybrid OA (SSH, 8%; STEM, 19%; exact $P < .01$) or use vouchers to publish for free in exclusively OA journals (SSH, 7%; STEM, 26%; exact $P < .001$).

Our earlier research showed that STEM authors tend to publish in prominent international journals; only a small proportion of their papers is published in Croatian or Croatian journals.[20] Some publications in international journals were OA to meet the requirements set by research funders, whereas only one Croatian scientific institution mandates OA by requiring authors to archive their publications in the institutional repository. Moreover, given the fact that local journals are OA by default, it is our opinion that only a small proportion of Croatian OA papers is published in OA not because doing so was mandatory but because their authors chose to act on their belief that OA is beneficial to scholarly publishing in general.

We found that Croatian STEM researchers were more likely than their SSH counterparts to secure funding for APCs from their institution (exact $P < .01$) or to use vouchers or coupons (exact $P < .01$). No significant differences were found with reference to other sources of financing (co-authors' institutions, national or international projects, private funds, etc.).

When asked which publisher best fulfilled their expectations in cases when they paid APCs, most of the authors highlighted Multidisciplinary Digital Publishing Institute (MDPI): in STEM, as many as 73% of authors included MDPI in the list of publishers that met their expectations. This high proportion is only to be expected, given that 44% of Croatian Gold OA or hybrid OA scientific output indexed in WoS Science Citation Index Expanded from 2020 to 2024 was published by MDPI.

Factors affecting journal selection

Respondents were also asked about factors that influenced their choice of a journal or a publisher. These factors included measures of a journal's reputation, such as its impact factor, ranking within the specific field, and affiliation with a prominent scientific society, as well as practical matters such as the speed of editorial processing, acceptance rates, publication fees, and post-publication promotion (Table 3).

These factors were analysed using principal component analysis, which yielded two factors, namely the scientific reputation of a journal ($\alpha = 0.60$, eigenvalue = 2.23, %V = 25%) and the practical aspects of publishing ($\alpha = 0.66$, eigenvalue = 1.87, %V = 21%), with a correlation of 0.07. Although the reliability coefficients are somewhat below expectations, they are not uncommon for exploratory studies[30] and indicate a need for a more comprehensive scale in future studies. The results of the analysis are shown in Table 3, and data on the responses to these questions, item by item, are available in Supplement 2.

In selecting a journal for publication, the respondents were motivated primarily by the journal's reputation. However, in-depth analysis showed disciplinary differences: STEM researchers tended to prioritize the

Table 3. Differences between respondents from STEM and SSH in factors influencing their choice of journals

Variable	Group	n	M	Standard deviation	t-statistic	*P*	Cohen's D effect size
Journal's reputation	SSH[1]	243	3.99	0.602	3.19	.002	0.258
	STEM[2]	471	4.13	0.517			
Practical aspects of publishing	SSH	243	3.47	0.676	-2.96	.003	-0.235
	STEM	471	3.31	0.657			

[1]Social sciences and humanities.
[2]Science, technology, engineering, and medicine.

reputation, especially current reputation and the journal's impact factor, more than their SSH counterparts did (Figure 2). Although many initiatives oppose using this indicator as a measure of journal quality, the Journal Impact Factor remains an important component in the assessment of scientific publishing activity, especially in small scientific communities.

On the other hand, practical aspects of publishing (publication fees, post-publication promotion, etc.) are more important to SSH researchers than to their STEM researchers (Figure 2). A manuscript's fit with the scope of the journal is equally important to both categories, as are the speed of editorial processing and acceptance rate. To respondents from SSH, post-publication promotion was more important than it was to their STEM counterparts (Cohen D = 0.423; $P < .001$). This was not surprising, since international visibility of SSH research often lags behind that of STEM, partly because SSH authors rely more on national publication outlets. Besides, the greater visibility of SSH research at the national level may increase its political and social impact. Publishers may help in the dissemination of research outcomes through social media or other alternative channels that reach the wider society beyond the confines of academia.

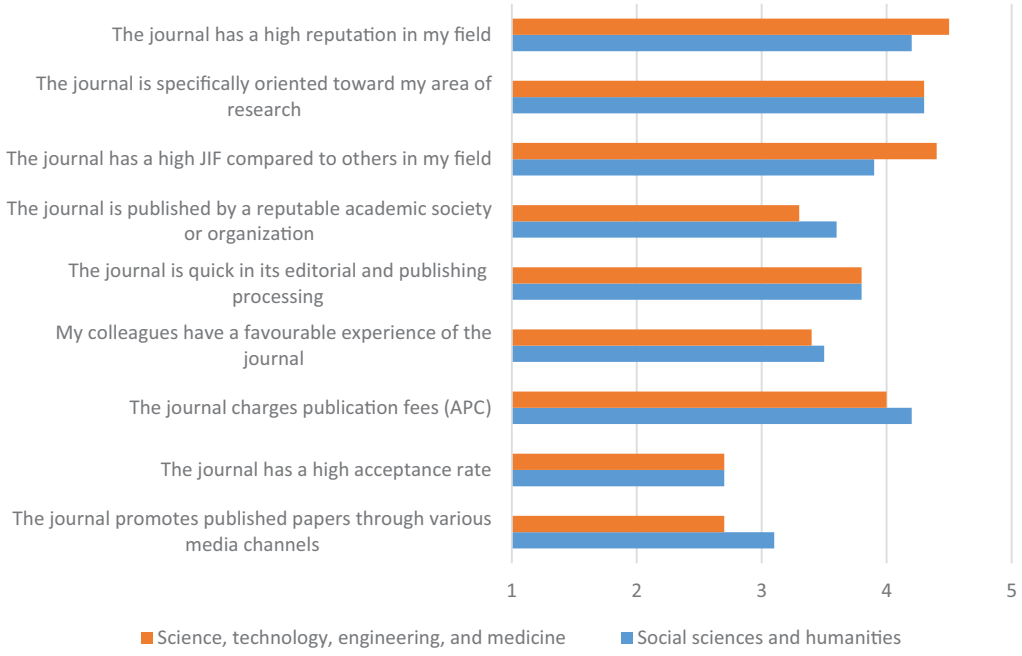

Figure 2. Average scores assigned by respondents from STEM and SSH to different factors that influenced their choice of a journal. Note: The responses are the scores assigned on a 1-to-5 Likert scale, ranging from 1, Strongly disagree to 5, Strongly agree.

Willingness to pay article processing charges

According to the results of our survey, STEM researchers were more likely to send their manuscript to an OA journal that publishes exclusively with APCs (exact $P < .001$). As many as 64% of STEM researchers would do so, in contrast with only 33% of SSH researchers.

Although STEM respondents expressed concerns about the impact of OA on the commercialization of scientific publishing and the reliability of peer review standards, their actions do not seem to reflect these concerns. Driven by the importance attached to publishing by institutions in career advancement and by funders in selecting proposals for funding, the researchers accept the 'publish-or-perish' system, thereby promoting commercial APC-based journals – even when such actions go against their beliefs.

The two categories of respondents did not differ significantly in their reasons for being willing to pay APCs: respondents from both groups were motivated primarily by a journal's reputation, regardless of its publishing model (Diamond OA, pay to publish, etc.).

A majority of respondents (60%) who did not want to publish in APC-based journals believed that such journals are more concerned about profits than about the quality of published articles. Additionally, 63% of SSH researchers declined to pay because they believed that there should be no barriers to publishing or accessing the results of research; this was the only question that led to significant differences (exact $P = .006$) between the two categories in their answers. This finding matches the findings of Segado-Boj and co-authors that the negative perception of APC was higher among arts and humanities and social science researchers than among researchers in STEM and the life sciences.[4]

It seems contradictory that although STEM authors were more willing to pay APCs, they reported that they did not have enough funds for the purpose (Figures 3 and 4). We assume that the contradiction was due to the fact that their research projects are financed mainly by the Croatian Science Foundation, and the limit placed by the foundation on APCs is below the higher APCs usually charged by the more prestigious STEM journals.

Choice of publishing model: who decides

The issue of who should decide on the publishing model was examined using a question with several items regarding the perceived control over publishing outputs. Principal component analysis showed a single-factor solution with an eigenvalue of 1.74 and 44.6% of explained variance; the total score was calculated as the sum of scores assigned to three

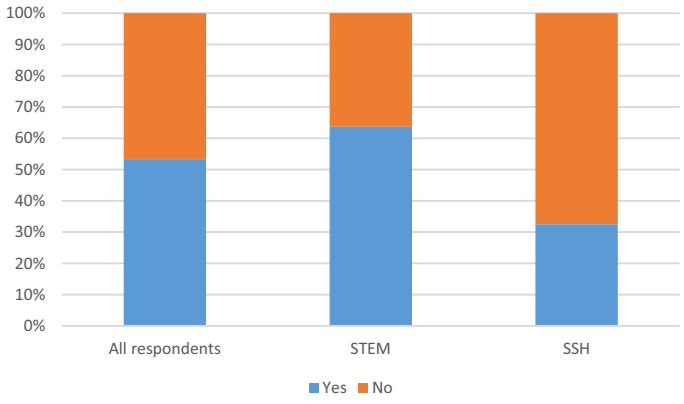

Figure 3. Authors' willingness (Yes) or unwillingness (No) to submit manuscripts to open access journals that publish exclusively with article-processing charges (STEM- Scence, technology, engineering, and medicine; SSH - social sciences and humanities).

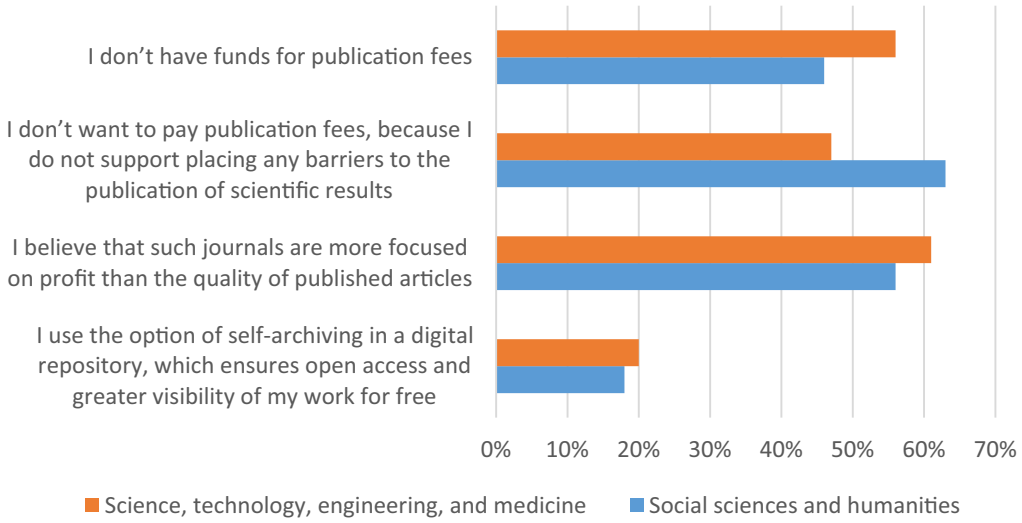

Figure 4. Proportion of respondents from STEM and SSH choosing different reasons for their unwillingness to publish in journals that impose article processing charges.

items, with a higher score indicating that the author should have greater rights in choosing the publishing model and a lower score indicating that the author's institution should have greater rights. The Cronbach alpha coefficient was 0.66, which indicates a need for a more comprehensive scale in future studies. The analysis of differences is shown in Table 4.

The two categories, SSH and STEM, showed no statistically significant difference in their overall choice of who should decide where and how they should publish the results of their research. Both categories believed that authors should have more control than funders or the authors' institutions over publishing models (for details, see Supplement 2). This finding is in line with an earlier study,[31] indicating that many authors believe they should have the liberty to decide where to publish their work since they know better than funders or governments about which audiences will benefit more from the knowledge.[31]

Limitations

Open access, not only in Croatia but also worldwide, remains a complex subject comprising multiple facets and perspectives. We used a quantitative self-assessment approach that enabled us to have a large sample with a heterogeneous background. One of the primary limitations was the lack of standardized instruments that would increase the comparative potential of our findings. Several questions in the survey were primarily focused on scientific journals, which may have influenced the publishing profiles of respondents and limited their perspectives. We did not collect demographic data, which also may have influenced the views expressed. Furthermore, a deeper understanding of the topic also requires qualitative in-depth interviews with various stakeholders.

Table 4. Differences in control over publishing modalities between STEM and SSH authors

Variable	Group	n	M	Standard deviation	*t*-statistic	*P*	Cohen's D effect size
Control over publishing modalities	SSH[1]	243	10.19	2.587	−0.46	.645	−0.037
	STEM[2]	471	10.10	2.368			

[1]Social sciences and humanities.
[2]Science, technology, engineering, and medicine.

Conclusion

The participants in the survey strongly supported the principles of OA and its benefits to science, education, and the public good. However, the participants also expressed concerns about the increasing commercialization of scientific publishing and the potential decline in peer review standards. The two categories of respondents, SSH and STEM, showed no significant differences in their general attitude towards OA publishing. The observed differences between them stemmed partly from the characteristics of their respective scientific disciplines and partly from the different criteria used in career advancement. Authors from STEM published significantly more in international journals and more in pay-to-publish OA journals, whereas those from SSH published significantly more in national Diamond OA journals; when they did publish in international journals, they preferred journals that do not charge for publishing. In selecting a journal for publication, the respondents were motivated primarily by factors related to the journal's reputation. However, in judging the reputation, STEM researchers tended to prioritize quantitative indicators such as the Journal Impact Factor, whereas SSH researchers placed greater emphasis on the journal being published by a reputable learned society or a similar non-profit publisher.

Researchers in STEM were more likely to send their manuscripts to OA journals publishing exclusively with APCs: nearly two-thirds of the respondents would do so, compared to only a third of the SSH respondents, who were more strongly opposed to paying publication fees irrespective of who paid the fees – their institution or funder – because of their belief that there should be no financial barriers to publishing or accessing the results of research. The requirements for career advancement in academia – the number of papers published in journals indexed and ranked in reputable international bibliographic databases – compel authors, particularly in STEM, to publish in pay-to-publish journals despite their beliefs to the contrary. This dissonance highlights the crucial role of policies governing both scientific evaluation and OS.

Our results, as well as the results of all Croatian OA studies referred to,[19,20,21,27] show that authors mostly choose the Gold OA route; only a small proportion of them opts for the Green OA, and the reasons for these preferences are yet to be examined.

The importance of 'national disciplines' and the reliance of Croatian SSH authors on local publishing infrastructure should motivate Croatian authorities to provide constant funding and to ensure the sustainability of the infrastructure. Even a slight reduction in financial support to Croatian scientific and professional journals, which enables them to continue to be Diamond OA, can expose them to market pressures, potentially leading them either to begin charging for publication or even to cease publication altogether.

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