

Taşkın, Z., Pölönen, J., Kulczycki, E., & Laakso, M. (2025). Mapping the publisher types and collaborations behind Web of Science indexed journals. *Quantitative Science Studies*. Advance Publication.
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Mapping the publisher types and collaborations behind Web of Science indexed journals

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Abstract

Although the organisational aspects of scholarly journals—such as the types of organisations responsible for publishing individual journals, whether independently or in collaboration—have significant implications for scholarly communication, they have received little focused research attention on a large scale. This study provides a comprehensive analysis of all WoS-indexed journals (N=21,886), focusing on the type of organisations that are officially attached to publishing the journals, either alone or together. We also investigate the disciplinary, geographical and linguistic diversity, and the key bibliometric characteristics, of journals (co)published by different types of organisations. By augmenting WoS metadata with a custom classification concerning organisational information about the journals publishing and governing organisations available through the International ISSN Centre, this study provides a larger and more detailed analysis than has been available so far. Our results show that 66% of journals are published by a sole organisation type (professional, research organisation, society), and 34% respectively are published through combinations of these different organisation types. The most common form of collaboration was a professional publisher with a scholarly society as the collaborative organisation.

Keywords: Publisher types, professional publishers, society publishers, research organisation publishers, Web of Science

Acknowledgments

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Conflict of interest

The authors declare no conflict of interest.

Data availability

The dataset used in this study is not publicly available due to licensing restrictions from a commercial database.

Author contributions:

ZT: Conceptualisation, methodology, data curation, data cleaning and standardisation, formal analysis, visualisation, writing – original draft, writing - review & editing, **JP:** Conceptualisation, methodology, data curation, writing – original draft, writing – review & editing, **EK:**

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Conceptualisation, methodology, writing – original draft, writing – review & editing, **ML**:
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1. Introduction

Several levels of analysis are used in bibliometric research and studies of the scholarly journal publishing landscape (McGrath, 1996). Commonly, author-level, article-level, journal-level, or discipline-level analyses are applied in broader studies. These units of analysis help explore citations, authorship, openness, and other key questions in bibliometrics over the past decade (Mejia et al., 2021; Verma et al., 2023). Overarching these levels is the publisher level—organisations that manage publication outlets—where diverse organisational contexts, including both commercial and non-profit operations, shape scholarly communication directly and indirectly.

Studies at the publisher level are relatively rare compared to the extensive research at lower levels of analysis. This gap is reflected in the lack of publisher-level focus in recent mappings of bibliometric and scientometric studies (Mejia et al., 2021; Verma et al., 2023). One of the few global analyses of the publisher landscape, an industry report, distinguishes between commercial publishers, learned societies, university presses, and library publishers (Johnson et al., 2018).

The limited knowledge about the organisational aspects of the scholarly journal publishing landscape represents not only a research gap but also a challenge for science policy, making it difficult to shape a system lacking relevant data. Recently, these organisational aspects have become central to policy discussions on the sustainability of scholarly publishing (e.g. Council of the European Union, 2023; Simard et al., n.d.; UNESCO, 2024). Governance and publisher arrangements are key to a global vision of scholarly communication that is more open, equitable, and controlled by the scholarly community rather than profit-driven commercial publishers. The EU-funded DIAMAS project's report, based on case studies from 10 European countries, highlights the diversity of national journal publishing landscapes (Taşkın et al., 2024). Although this is a rapidly evolving policy area, with ongoing debates on definitions and criteria, the lack of comprehensive data on publishers remains a barrier to assessing the current landscape and monitoring future changes.

Several challenges hinder detailed studies at the publisher level of scholarly journals. First, there is a lack of standardized definitions and categorisations for different types of organisations, both in the research literature and across bibliometric databases. As shown later in this paper, existing studies often rely on unique, ad hoc categorisations, making cumulative knowledge-building difficult. Another challenge is the dynamic nature of the data, as scholarly publishing is in constant flux. Journals frequently change publishers, whether through individual decisions or larger mergers and acquisitions. Since 2008, the International ISSN Centre has offered a service to track publisher changes for enrolled publishers (Bazeley & Béquet, 2019; ISSN International Centre, 2018), but bibliometric studies still face difficulties in navigating this ever-changing landscape.

Moreover, organisational structures behind journals vary widely, from single-entity operations to collaborations between multiple organisations (Clarke, 2020; Wise & Estelle, 2020). Governance arrangements in such cases are often opaque, making it difficult to discern ownership or the role of professional publishers, especially when they serve under time-bound contracts. A specific technical challenge is the lack of metadata to distinguish between publishers and their imprints. Bibliometric databases employ different methodologies to address this issue, often relying on proprietary augmentations of organisational data from official ISSN records, which can simplify or obscure critical details.

This paper aims to unveil distinct publisher patterns among Web of Science (WoS) -indexed journals and study the differences between various publisher contexts, on a more nuanced level of classification compared to existing studies. While there exists a broad range of national and international databases and lists of journals (Pölönen et al., 2020), we choose to use WoS as the source because we want to concentrate our analysis on a standard international subset of journals in this first implementation of this analysis method, utilising an index that has been the focus of most bibliometric studies of the scholarly communication. We understand that the picture of the journal publisher landscape which emerges from WoS-based analysis is not representative of the global landscape of journals, for example in terms of fields, regions and languages (Asubiaro et al., 2024; Khanna et al., 2022).

This study of WoS-indexed journals is conducted through a novel classification method into publisher types not just based on publisher name in WoS, but by incorporating data about the governing body for each journal from the International ISSN Centre. Our focus encompasses geographical locations, languages, subject categories, impact, and open access patterns of journals by different types of (co)publishers. Additionally, we delve into bibliometric data to identify unique patterns associated with three different publisher types, distinguishing professional, research organisation and society publishers. Our research questions are as follows:

- What is the distribution of publisher types (Professional, Society, Research organisation) in WoS in terms of published journal counts, also considering the type of governing organisation for each journal (Professional, Society, Research organisation)
- For the different publisher types identified, also considering collaboration between different types of organisations, is there a difference in distribution for the following aspects concerning scholarly journals within each publisher type category?
 - Country of origin and publication languages?
 - Indexing distribution among WoS citation indexes?
 - Journal subject categories?
- In addition, we investigate differences between publisher and collaboration types regarding productivity, co-authorship and open access of journals:
 - Number of published articles and citations received?
 - Share of international and national co-publications?
 - Share of open-access journals?

To address the complexity of the scholarly publishing landscape, this study aims to map the influence of different publisher types on key bibliometric indicators, including publication volume, co-authorship, and citation counts. By examining the distribution of domestic and international collaborations among different publisher types, we seek to uncover potential patterns that may otherwise remain unnoticed. Understanding these patterns is essential as publisher types might influence not only the dissemination and visibility of research but also the collaboration networks that support scholarly communication. This mapping approach is crucial for informing research evaluation systems that often rely heavily on these indicators. By exploring how publisher types relate to collaboration patterns, we aim to contribute to a more nuanced understanding of the scholarly publishing ecosystem.

2. Previous research

This section provides an overview of prior studies on publisher-level analysis. These studies have examined publisher distinctions by size and organisational context. Two key research areas include national-level analyses and studies focusing on open-access (OA) publishers, particularly those investigating predatory practices and identifying questionable or grey-zone publishers. The second part of this section highlights research on specific types of publishers and studies exploring collaborations in publishing activities.

2.1. Publisher-level studies on scholarly journal publishing

One of the most comprehensive studies on publisher-level changes in the scholarly journal landscape is Larivière et al. (2015), a longitudinal analysis of publisher data in WoS from 1973 to 2013. This study examined changes across disciplines and tracked journal mergers with larger or smaller publishers by manually managing imprint data from mergers and acquisitions, building on Munroe's (2007) foundational work. Larivière et al. (2015) found significant market concentration, with the five largest publishers accounting for over 50% of WoS article output in 2013. However, the study did not extensively differentiate between publisher types or collaborative arrangements beyond highlighting the dominance of commercial publishers. More recently, van Bellen et al., (2024) analysed the concentration of publication volume to the largest publishers comparing WoS, Dimensions and OpenAlex as data sources.

Kim & Park (2022) conducted a study of journals and publishers based on the JCR 2016, JCR 2018, and JCR 2020 journal lists. The study of publisher type was limited to the 19 publishers that each published more than 10,000 articles per year. The publisher categories were Large (6 publishers, 6302 journals), OA (5 publishers, 292 journals), Society (4 publishers, 250 journals), University & other (4 publishers, 557 journals), and Others (i.e. not categorised due to small size) (1761 publishers, 3552 journals).

2.1.1. Publisher type categorisation in national contexts

Navas-Fernández et al. (2018) analysed publisher types as part of a broader study on journals published in Spain, and indexed in WoS and Scopus. They classified publishers into four categories based on manual data from journal websites: commercial (publishing companies), private non-profit (e.g., professional associations, scientific societies, royal academies, etc.), academic (universities and research centres), and government agencies. The study found that journals published by commercial entities tended to have higher internationality indicators (e.g., English language, foreign authorship, international collaborations, and foreign editorial board members). However, differences across publisher types were generally small, except for government-published journals, which scored lower on several indicators.

Late et al. (2020) examined Finland's national scholarly publishing landscape, including books and journals. Analysing 347 serials, the study categorized publishers into learned societies, universities or university presses, other research organisations, commercial publishers, and others, though the methodology for these classifications was not detailed. The study found that learned societies published 72% of Finland's peer-reviewed scholarly journals, universities and research organisations 20%, and commercial and other publishers only 8%.

Sanz-Casado et al. (2021) studied the impact and visibility of 282 national language journals in humanities from Norway, Finland, and Spain, distinguishing between three publisher types:

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commercial, society, and institutional. The study did not elaborate on the methodology for these classifications. Key findings revealed that society publishers dominate in Finland, institutional publishers are more prevalent in Spain, and commercial publishers lead in Norway.

Jamali et al. (2022) examined Australian journals using international and national data sources to compile a list for detailed analysis. Unlike other studies, it separately analysed journal ownership and publisher information to better understand the governance and national connection of journals. Ownership data was primarily sourced from ULRICHSWEB's "Corporate author" field, supplemented by manual searches when necessary. For 651 active peer-reviewed journals, publisher and owner organisations were categorized similarly, with publishers having an additional "Self-publish" category. Self-publish referred to journals published by their owners, a common trait in Australia (65%). International commercial publishers handled 35% of journals, most of which were owned by non-profits, particularly scholarly societies and educational institutions. The study also found that journals owned by educational organisations were more likely to publish OA without article processing charges (APCs) compared to other ownership types.

In a recent preprint, Beigel (2024) analysed publisher types for 1,971 journals listed in SciELO and Redalyc, which are journal hosting portals serving primarily Latin America. The study found that universities published 1,241 journals, learned societies 428, public agencies or hospitals 118, and independent academic groups 61. Additionally, 61 journals were published by small specialized publishers, while only 57 were published by oligopoly publishers.

2.1.2. Publisher type categorisation: open access publishers

Research on academic publisher types often focuses on the economic aspects of journals. Earlier studies examined subscription pricing (e.g. Bergstrom et al., 2014), while more recent work explores OA journals' tendency to charge fees (e.g. Crawford, 2024).

Solomon (2013) analysed OA journal publishers indexed in Scopus, cross-referencing with the DOAJ. The study manually categorized 1,948 active journals into six types: professional (34%), society (26%), university (24%), scholar publisher (2%), government (5%), other organisation (7%), and unknown (3%). The article notes that "...a significant number of societies are associated with journals published by professional publishers..." and resolved this by coding "these journals as professionally published when a professional publisher was listed in Scopus and the DOAJ as the publisher of record.". The study also compared disciplinary distributions, the prevalence of APCs, and the proportion of journals that were OA from inception versus those that later adopted the model.

Building on Solomon (2013), Ennas & Di Guardo (2015) cross-referenced Scopus and DOAJ to study 1,910 "top-rated gold OA journals," using publisher type as one of seven variables. They relied on Solomon's (2013) data for publisher classification and OA status. Regression analysis revealed that publisher type and whether a journal was OA from inception or later were the only non-significant variables in relation to the Scimago Journal Rank citation index.

Gadd et al. (2018) conducted a longitudinal study of 100 publishers in the SHERPA/RoMEO database from 2004 to 2016, examining changes in publisher-level OA policies. Publishers were categorized by size (based on journal count) and type (commercial, university press, society, and other). While restrictions on self-archiving did not vary significantly by publisher type, the uptake of paid OA options differed markedly by 2016: 87% of commercial

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publishers offered paid OA, compared to 47% of learned societies and 25% of university presses.

Crawford (2024) analysed 19,422 active journals in the DOAJ as of 2023, categorizing them into four groups: Open Access publishers (16.6%), Universities/Colleges/Institutes (60.6%), Traditional publishers (9.6%), and Societies/Associations/Government agencies (13.1%). The share of APC-based journals varied significantly: 90% for Open Access publishers, 94% for Traditional publishers, 53% for Universities/Colleges, and 33% for Societies/Government agencies, with the latter two also charging lower average fees when applicable.

Laakso et al. (2021) investigated vanished OA journals, finding that about half of the 174 inaccessible journals were published by research organisations (86) or scholarly societies (16). While the study did not explore specific reasons, prior research suggests that such journals often operate with limited resources, relying on volunteer efforts and less robust technical platforms, making them vulnerable to organisational or technical disruptions (e.g. Björk et al., 2016; Morrison, 2016).

Over the past decade, the publisher level has been most prominently discussed in the context of “predatory publishers,” a phenomenon that grew alongside APC-driven OA journals. Despite ongoing debates around defining “predatory” or “questionable” journals, this remains one of the most active areas of publisher-level research. This focus likely stems from the observation that issues of scholarly misconduct often span entire publishers, with inadequate peer review and research integrity practices across all their outlets (e.g. Siler et al., 2021).

2.1.3. *Studies on individual publisher types*

This section reviews key studies that focus on specific publisher types, often incorporating qualitative elements, in contrast to the broader bibliometric analyses discussed earlier.

Scholarly societies and associations play a significant role in scholarly publishing, as reflected in many of the broader studies reviewed. These organisations are often tied to national contexts, as seen in Delicado et al.'s (2014) study on Portuguese scholarly societies. Using a mixed-methods approach—including a web survey of 266 societies and case studies of 24 organisations—the study found that slightly over half were involved in journal publishing. Qualitative findings highlighted a tension between maintaining Portuguese-language journals and the growing demand for international, English-language outlets. Some societies discontinued older journals in favour of launching international ones, which proved more financially sustainable.

Fyfe (2022) provides a historical analysis of UK scholarly societies’ publishing practices in the decade after World War II, highlighting how commercial interests and the growing international dissemination of journals introduced significant changes. Hewitt et al. (2017) examined 40 UK scholarly societies to explore their activities, income, and expenses. Most societies engaged in journal publishing, with revenue from publishing ranging from single digits to 99.8%. International publishing was noted as a major income source, but confidentiality clauses prevented detailed analysis of agreements with external publishers. Johnson & Malcolmson (2024), in a recent preprint, conducted a longitudinal study of 277 UK scholarly societies (2015–2023), focusing on publication activities and revenue trends. They found that societies with external publishing partners often experienced revenue declines, while self-publishing societies saw sustained growth, linking these trends to the broader shift toward OA publishing.

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Late et al. (2020) analysed the publishing activities of Finnish scholarly societies, finding that 70% of peer-reviewed publications in Finland (2011–2017) were published by such organisations, primarily in journals with minimal involvement in book publishing. Expanding beyond Finland, Late et al. (2024) surveyed 194 scholarly societies in the social sciences and humanities across eight European countries. The survey revealed that 86% were involved in publishing, predominantly multilingual journals. Only about 10% reported collaborating with private companies to support their publishing activities, while most societies did not engage in such partnerships. This leads to the final research category: studies investigating publishing collaborations.

2.1.4. Studies on collaborations in publishing

Targeted research on collaborative publishing between different organisations is limited. Ashman (2009) conducted a web survey of 22 scholarly societies from the UK and Europe, exploring their preferences for publishing partners. Key factors in partner selection included reputation, focus on individual title development, and innovation in technology and business models. Societies also valued high financial returns and well-executed core services like customer service, fulfilment, production, sales, and marketing when outsourcing publishing functions.

Clarke (2020) reviewed the key elements of publishing service agreements between scholarly societies and professional publishers, outlining how responsibilities are divided and the pros and cons for societies in entering such agreements.

Libraries are often mentioned in scholarly publishing as institutional publishers, typically through university presses. However, they also collaborate with other organisations, as illustrated by Stapleton (2019), who describes how the University of Florida's George A. Smathers Libraries partner with scholarly societies to publish journals. The article includes an appendix with a template for structuring such collaborations, clearly outlining responsibilities.

Wise & Estelle (2020), as part of a broader project involving interviews and workshops, conducted a web survey of 105 scholarly societies, primarily from the US and Europe. Of these, 72% published with larger partners, while 28% were independent publishers. The study revealed significant differences between STEM and HSS societies in self-publishing and adoption of OA options, emphasizing the importance of discipline-specific considerations in scholarly society publishing, as societies are far from uniform.

Asai (2021) studied collaborations between research institutes and professional publishers, focusing on 15 OA journals with at least 20 years of citation tracking in Scopus. Even though the study uses the term “research institute” to describe the organisations, they are, in fact, what other studies call scholarly societies and associations. This longitudinal study examined the impact of publisher collaboration on citation metrics (Scimago Journal Rank & SNIP) and two author-affiliation measures: internationality (ratio of international to local authors) and author distribution concentration (sum of squared proportions by country). Collaboration generally improved internationality and citation metrics, though the small sample and lack of broader controls limited the conclusiveness of these findings.

The reviewed studies reveal no clear consensus on categories or definitions for distinguishing between publisher types, limiting comparability and hindering cumulative knowledge building in this area. Moreover, few studies have addressed collaborations between different organisations in journal publishing. Based on the literature (see Table 1), we propose distinguishing three broad publisher types by primary function: 1) professional publishers,

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focused on publishing scholarly journals and books; 2) research organisations, dedicated to employing or funding researchers for research and higher education; and 3) scholarly societies, which organize voluntary researcher communities to advance their fields at national, regional, or global levels.

While universities and societies may operate professional publishing activities (e.g., university presses), publishing is not their primary function. In more detailed studies, it may be useful to distinguish between research organisations such as higher education institutions and government agencies. Societies could be further categorized into national academies, registered scholarly associations, and informal networks of scholars publishing independent journals, though classifying the latter can be challenging.

Table 1. Publisher type categories employed in the research literature

Study	Professional publisher	Research (performing or funding) organisation	Scholarly society
Navas-Fernández et al., 2018	- Commercial	- Academic	- Private non-profit
Johnson et al., 2018	- Commercial publishers	- Government agencies	- Learned society publishing
		- University presses	
Late et al., 2020		- Library publishing	
	- Commercial publishers	- Universities and university presses	- Learned societies
Sanz-Casado et al., 2021	- Commercial international	- Other research organisations	- Society
Jamali et al., 2022	- Commercial small	- Institutional	
		- Government	- Non-profit organisation
Beigel, 2024		- Educational	
	- Small specialized publishing house	- University, faculty, research institute	- Academic society, independent academic centre and professional association
	- Oligopolic publisher	- Government agency or public hospital	- Independent journal
Solomon, 2013		- University publishing house	- Society journals
	- Professionally published journals	- University published journals	- Independent scholar publisher
Crawford, 2024		- Government agency	- Societies, associations and government agencies
	- Traditional publishers	- University, college or institute	
Gadd et al., 2018	- Open access publisher	- University press	- Learned society

3. Data and method

To understand the main characteristics of journals indexed in WoS and answer the research questions, we designed the data collection process as shown in Figure 1.

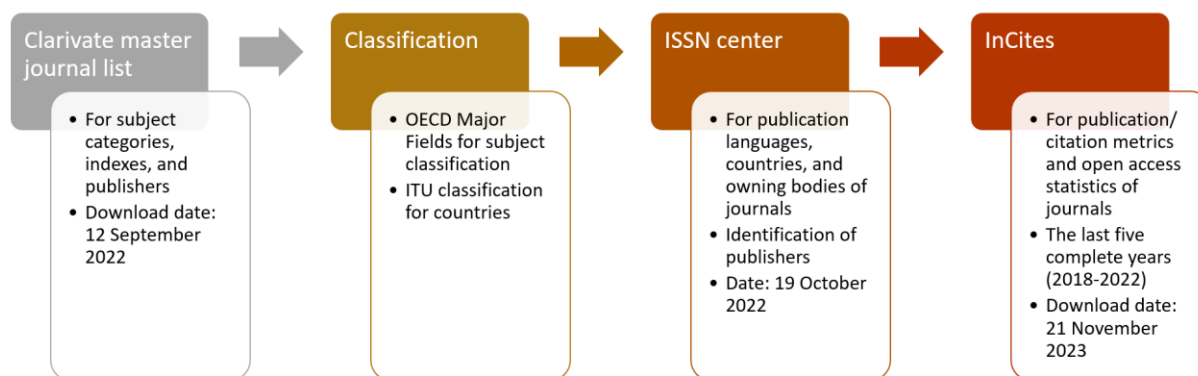


Figure 1. Data collection process and data sources

We used different sources to gather and classify journal data. All data on the journals indexed in the WoS Core Collection were downloaded from the Master Journal List (MJL) (Web of Science Group, 2022) on 12th September 2022. This includes Science Citation Index Extended (SCIE), Social Sciences Citation Index (SSCI), Arts & Humanities Citation Index (AHCI) and Emerging Sources Citation Index (ESCI). The data covers basic metadata for the journals such as WoS subject categories, indexes, languages, and publisher.

To enhance the dataset with detailed information on publication languages, countries, and owning bodies of journals, we utilized data from the ISSN Portal, downloaded on 19th October 2022. This access provided comprehensive information about the publishers. The Federation of Finnish Learned Societies (TSV) conducted an extensive integration and deduplication process to ensure data accuracy.

We classified the WoS subject categories into major fields using the OECD category scheme (Clarivate Analytics, 2012). Six major fields were determined as medical sciences, natural sciences, engineering & technology, agricultural sciences, social sciences, and humanities & art. Journals that belong to two or more subject categories were classified as multidisciplinary. We used the International Telecommunications Union's classification¹ to group countries by geographical regions.

To address the research questions, we downloaded publication and citation metrics from InCites, limiting our search to the five-year period from 2018 to 2022. The selected variables include Web of Science documents, times cited, times cited without self-citations, citations per publication, documents cited, collaboration rates (both international and domestic), and Open Access-related data. We did not conduct a normalisation process for subject categories, but we present the distribution of these metrics across subjects in the bibliometric analysis section. Our primary aim is not to reveal the bibliometric characteristics of specific fields; instead, we focus on mapping the main features of publishing across different publisher types.

We used R Commander with the *kmgplot* plug-in, and IBM SPSS Statistics 23 for statistical tests and visualisations conducted on 21,866 journals. Effect sizes (*Cramer V* for Chi Square, and Cohen's formula (2013) for Kruskal Wallis and Mann Whitney U tests) were also presented in addition to *p* values to provide more insights about the statistical tests (see formula 1 and 2). Although our dataset represents a population rather than a sample, we opted for non-parametric tests such as Kruskal-Wallis and Mann-Whitney U because the data did not meet the normality assumption required for parametric tests. Given the non-normal

¹ <https://www.itu.int/en/ITU-D/Statistics/Pages/definitions/regions.aspx>

distribution of the data, relying on parametric tests could lead to misleading conclusions. Non-parametric tests are more appropriate in this context as they do not assume a normal distribution, ensuring more reliable results for the comparisons conducted in this study.

$$\text{Kruskal Wallis } \eta_H^2 = (H - k + 1)/(n - k) \quad (\text{Formula 1})^2$$

$$\text{Mann Whitney } U \text{ } r_G = 2(\underline{R}_A - \underline{R}_B)/N_T \quad (\text{Formula 2})^3$$

3.1. Classifying publishers

The term “publisher” can be interpreted in different ways within the diverse contexts of scholarly journal publishing, so it is worthwhile to briefly discuss its definition. The definition of entities responsible for journal publications has been particularly developed in the field of library and information science for identifying and cataloguing journals. Many bibliometric databases use ISSN data as foundational metadata before potential proprietary augmentation, making it meaningful to inspect how such information is recorded. The International ISSN Centre uses MARC 21 fields to describe journal metadata and the publisher information is provided as mandatory information (MARC 21: Field 260). This includes the place of publication, name of the publisher, and date(s) of publication (ISSN International Centre, 2015). According to the ISSN Manual (p. 91), multiple publishers can be recorded for a single journal, each listed in a separate subfield in the order in which they appear. However, in this study, which aims to capture and analyse publisher collaborations, first, we categorized the main publishers of journals into three groups using the more streamlined and standardized data from the MJL. The classification is as follows:

- **Professional publishers:** Publishers that have INC, PRESS and similar names in their title were identified as professional publishers. Some lists, such as oligopoly publishers (Larivière et al., 2015) and the OASPA list⁴ provided hints to classify professional publishers.
- **Society publishers:** The journals maintained by associations, foundations, societies, or communities were classified as “society publishers”. Different languages were considered (e.g. gesellschaft, associação).
- **Research organisation publishers:** We classified universities, research institutes, governmental organisations and science academies as “research organisation publishers”. All languages were considered.

Although MJL provides standardized data about publishers, there was a need for information on the collaborative bodies of the journals, which can be a co-publisher or not. We gathered a list of publishers, including corporate and issuing bodies, from the ISSN Centre by matching their ISSNs with the MJL ISSNs list. Later in the project, we conducted manual checks to ensure the accuracy and currency of the ISSN Centre's data on publishers and collaborative bodies.

In the 720 field of MARC 21, the issuing bodies, defined as corporate bodies under whose auspices a continuing resource may be published (p. 162), are provided. Since the issuing body may or may not be intellectually responsible for the continuing resource and may or may not be the publisher, we used that data to understand the main collaborators of journals and

² H is the Kruskal Wallis Test statistic, k is the number of groups. n is the total number of observations.

³ R_A and R_B are the average ranks for the groups, N_T is the total number of observations.

⁴ <https://www.oaspa.org/membership/current-members/>

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conducted the same classification (professional, society, and research organisation) for collaborators data. At the end of the classification, we had two columns showing publisher types and collaborator types using the same classification scheme. All analyses were conducted on these two columns to answer the research questions. This study focuses on revealing collaboration patterns between different organisation types; thus, cases of in-group collaborations, such as between societies, research organisations, or professional publishers, are not covered.

4. Results

4.1. Publisher types, sizes and collaborations

Of all 21,886 WoS-indexed international journals analysed in this study, 74% are published by professional publishers, 17.2% by research organisations, and 8.7% by societies. The largest share of journals published by professional publishers in collaboration is with societies (25.5%), while the share of journals co-published with research organisations (13.5%) or with both societies and research organisations (4.2%) is smaller. Around one-third of the journals (34.3%) are published in collaboration with other organisations. The share of collaboratively published journals is the largest for the professional publishers, of whose journals 43.2% are co-published. In the case of society and research organisation publishers, the share of collaborated journals is relatively small (10.9% and 8.5% respectively). When counting together both sole published journals and those published in collaboration, 74.4% of the WoS-indexed journals involve professional publishers, 29% societies, and 27.8% research organisation publishers (See Figure 2).

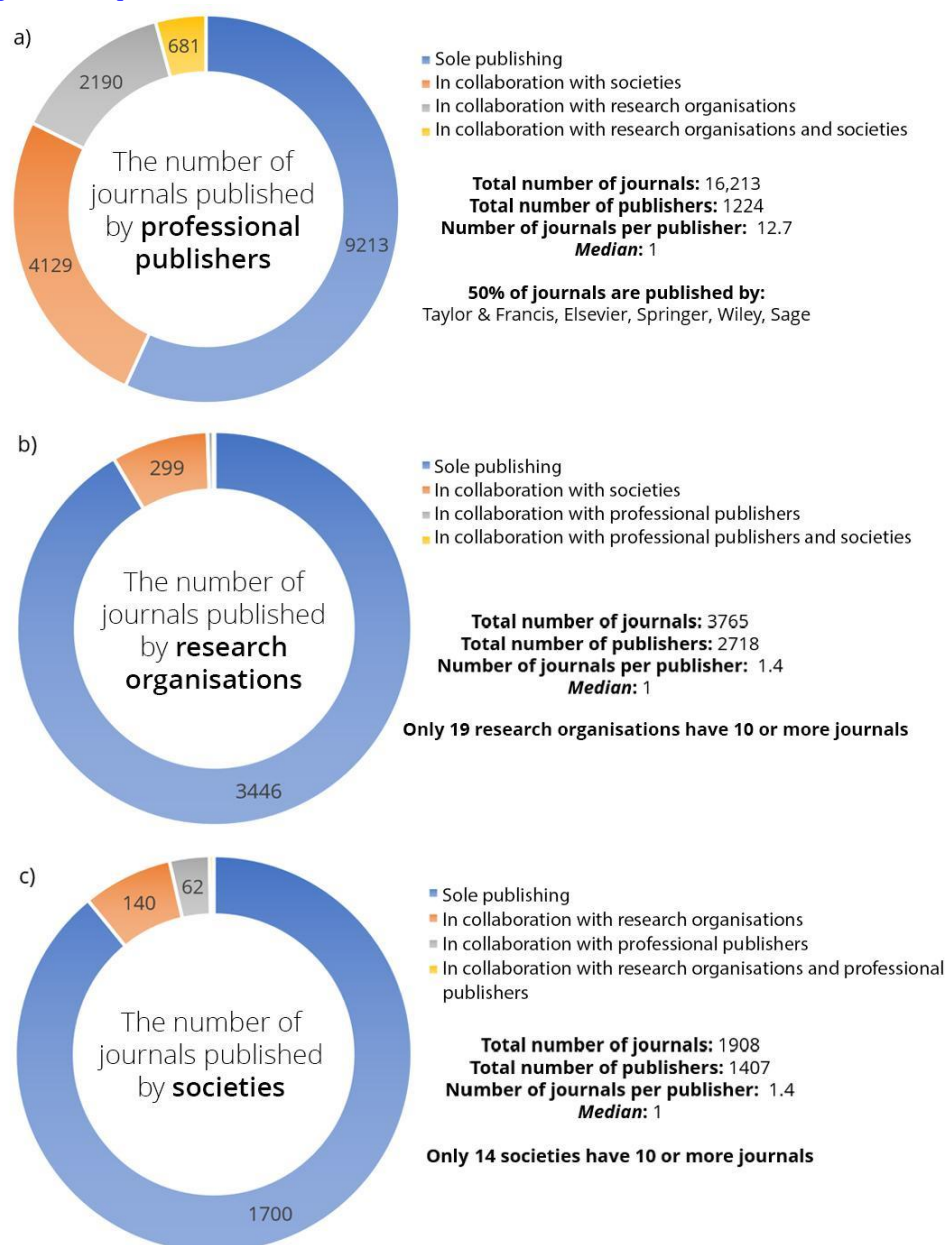


Figure 2. Share of collaborations by publisher types and sizes

4.2. Language distribution of journals

According to our dataset, 78.4 % of 21,886 journals are published in English, 11.4 % are Multilingual, possibly including English, and 10.2% are published in languages other than English. As shown in Figure 3-a, English is the primary language preference for 89% of professional publisher-led journals, whereas it is 67% for society published journals and 38% of journals published by research organisations. Multilingual and other language publications are very rare among professional publishers. However, the language distribution among society and research organisation publishers is more homogeneous, especially for research organisations (28% multilingual, 33.5% other languages). Statistical test results confirm that the types of publishers differ based on the languages of journals ($\chi^2(4)=4967.083, p<0.001, V= 0.337$). All these findings provide evidence of the greater language diversity of journals published by societies and research organisations compared to professional publishers.

In Figure 3-b, the distribution of collaborators in journals is shown. While journals solely published by professional publishers are mostly in English, when society or research organisation support is involved, the language preferences of journals become diversified. One of the most interesting findings is that more than 60% of research organisation-led journals use languages other than English. However, when research organisation publishers collaborate with societies or professional publishers, the share of English-language journals increases. Statistical test results confirm that the languages of journals differ across collaborators ($\chi^2(12)=5048.852, p<0.001, V= 0.340$).

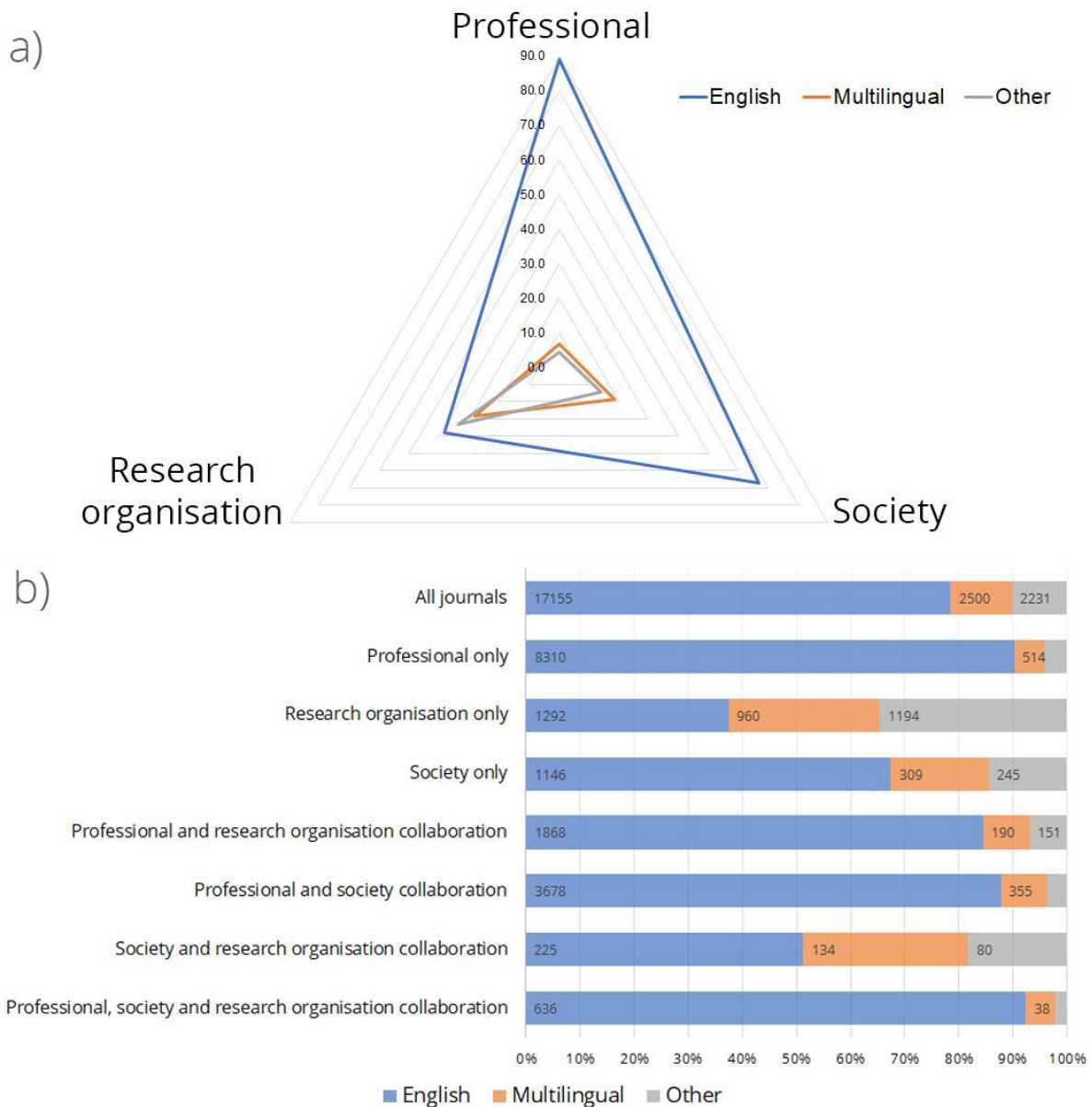


Figure 3. a) Language distribution of journals categorised by publisher types. b) Distribution of collaborators in journals and languages

4.3. Regional distribution of journals

Of all 21,886 journals in our dataset, 52% are published in Europe, 28% in North America, 12% in Asia & Pacific, 5% in South/Latin America, 2% in the Middle-East, and 1% in Africa.

Taşkın, Z., Pölonen, J., Kulczycki, E., & Laakso, M. (2025). Mapping the publisher types and collaborations behind Web of Science indexed journals. *Quantitative Science Studies*. Advance Publication. <https://doi.org/10.1162/qss.a.14>

Figure 4-a illustrates the regional distribution of journals, showing that regional diversity is linked to publisher type. The vast majority (87.5%) of journals led by professional publishers are situated in Europe and North America, with a relatively small share for other regions. The journals published by societies have a greater regional diversity outside Europe and North-America, with a notable share of journals from Asia-Pacific and also South-Latin America. The prominence of research organisation-led journals in South-Latin America is notable and deserves attention. While the research organisation publishers are dominated by European journals, this group differs especially in the low share of North-American journals. Journals are also distributed to the Middle East and Africa, with professional publishers contributing the smallest share (1.2% for the Middle East and 0.7% for African countries), compared to society publishers (1.5% for the Middle East and 1.5% for African countries) and research organisation publishers (3.2% for the Middle East and 1.3% for African countries). A statistical test confirms that the types of publishers differ across regions ($\chi^2(10)=4136.849$, $p<0.001$, $V= 0.307$).

Figure 4-b reveals that journals by professional publishers show increasing regional diversity beyond Europe and North-America when published in collaboration with societies or research organisations. In the case of society publishers, the journals co-published with research organisations seem to show lesser regional diversity, while in the case of research organisation publishers collaboration with societies is related to greater regional diversity. The substantial difference in distribution is confirmed by statistical tests ($\chi^2(30)=5020.403$, $p<0.001$, $V= 0.214$).⁵

⁵ Since the number of journals with stakeholders from “professional, society, and research organisation collaboration” category is low, the results of the test conducted excluding this class yield $\chi^2(25)=4727.543$, $p<0.001$, $V= 0.211$.

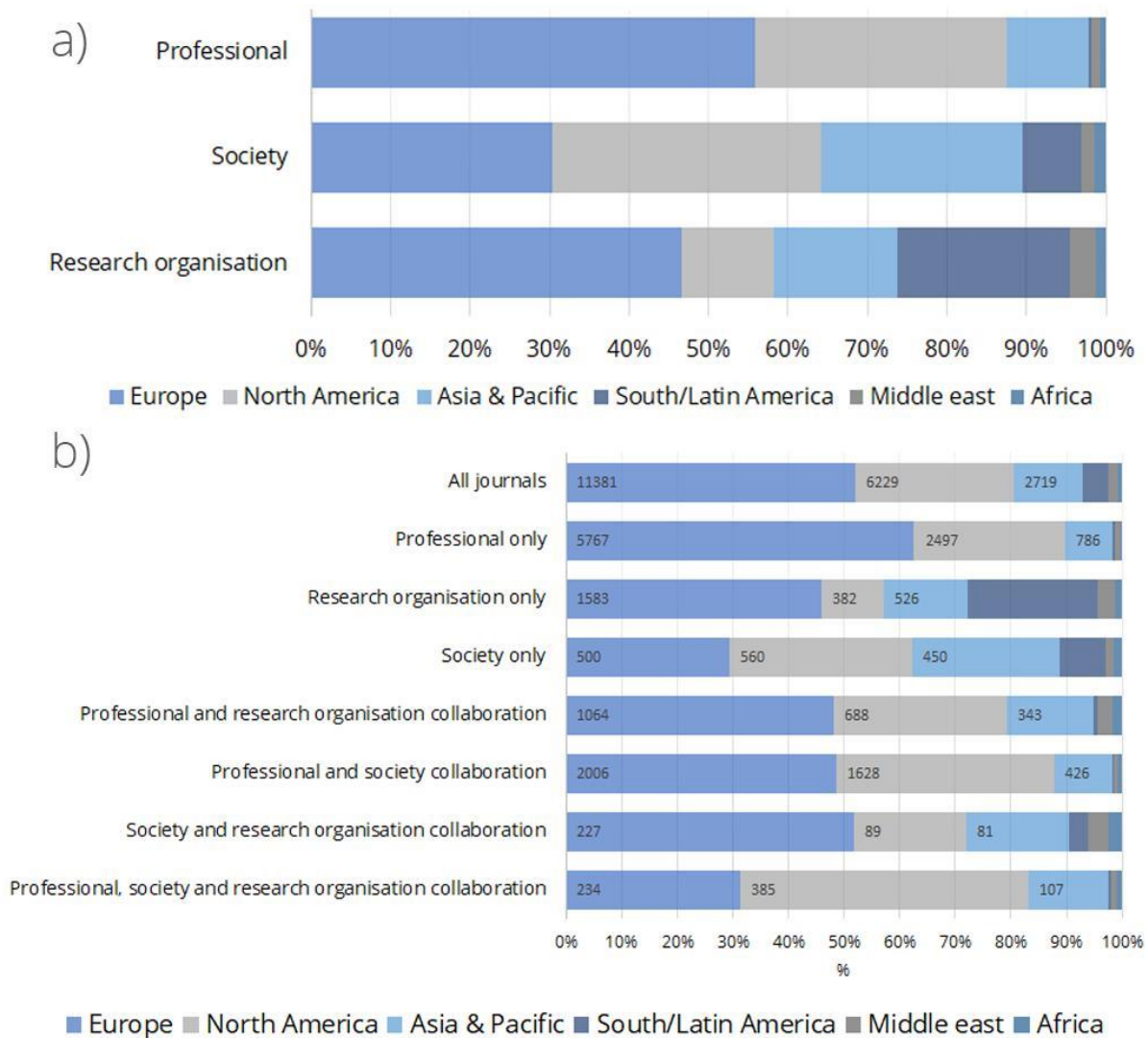


Figure 4. a) Regional distribution of journals categorized by publisher types. b) Distribution of collaborators in journals and regions

4.4. Distribution of subject categories

Figure 5-a illustrates the subject distribution of journals among different publisher types. Medical and health sciences journals dominate the coverage for professional-led journals at 26%. In contrast, the WoS-indexed society publishers' journals focus on natural sciences (25%) and medicine (22%), while research organisation publishers predominantly cover social sciences (32%) and humanities (28%). Professional-led publishers stand out with the highest percentage of multidisciplinary journals (14%), surpassing society publishers (9%) and research organisation publishers (3%). This discrepancy may indicate the presence of well-known and widely discussed multidisciplinary professional journals (Wei et al., 2024; Wu et al., 2023). Notably, journals in high citation potential fields like medical and natural sciences are predominantly published by professional publishers, whereas those in lower citation potential fields like social sciences and humanities are more common among research organisation and society publishers. Statistical tests confirm a significant difference in subject distribution among publisher types ($\chi^2(12)=1685.278, p<0.001, V=0.196$).

The significant difference in subject distribution extends to collaborators as well ($\chi^2(36)=2419.231, p<0.001, V= 0.136$). We highlight especially the collaborations of society and research organisation publishers. The collaboration between these two publisher types does not substantially impact the distribution of journals across subject categories compared to professional publishers, demonstrating a parallel trend between research organisation and society-only publishing, as well as society and research organisation collaboration. However, the introduction of professional collaboration leads to a significant shift in distribution with respect to natural and medical sciences (see Fig 5-b). Investigating the reasons behind this change would be worthwhile.

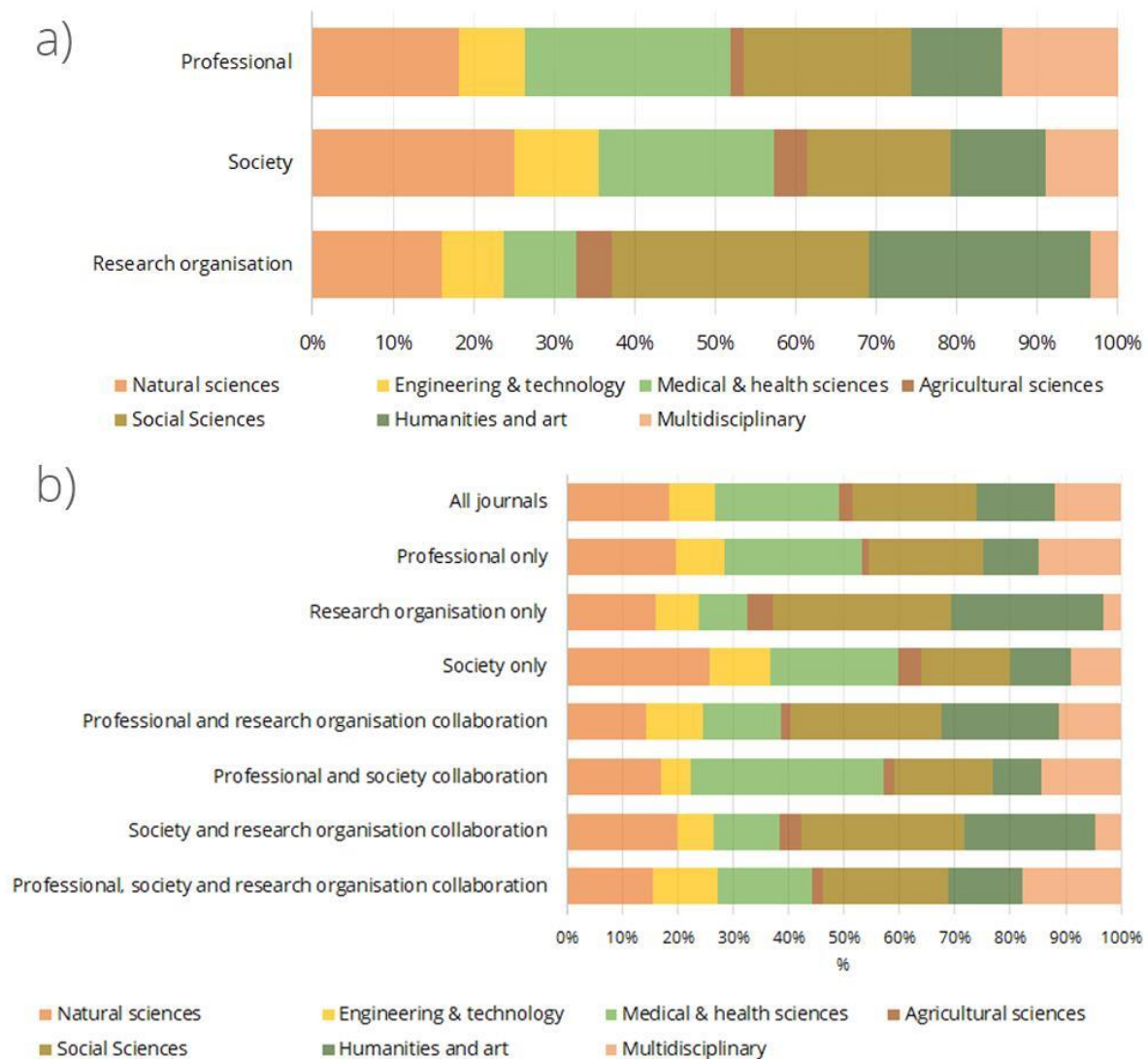


Figure 5. a) Subject distribution of journals categorized by publisher types. b) Distribution of collaborators in journals and subject categories

4.5. Distribution of journals to the indexes

The indexing criteria of WoS have been subject to prolonged scrutiny, with discussions suggesting bias in favour of certain countries and publishers (Chavarro et al., 2017; Luwel, 1999; Pranckutė, 2021; Tennant, 2020; Vanderstraeten & Vandermoere, 2021). It is

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<https://doi.org/10.1162/qss.a.14>

imperative to discern patterns in the indexing preferences of the WoS among its indexes. According to its journal evaluation and selection process, WoS maintains a hierarchical system between the SCI/SSCI/AHCI and the ESCI indexes. Journals that meet basic quality criteria are included in the ESCI, while those that also meet additional impact criteria are classified under SCIE, SSCI, or AHCI based on their subject area, being referred to as “flagship journals.”⁶ Our findings indicate that flagship journals are predominantly those managed by professional publishers (see Fig 6-a). The choice of indexing by WoS significantly varies across publisher types ($\chi^2(6)=2008.492, p<0.001, V= 0.220$).⁷ Specifically, 40% of society journals and 69% of research organisation journals are indexed in ESCI, while only 29% of journals published by professional publishers are included in that database. Conversely, 65% of professional publisher journals are indexed in the three core indexes (SCIE, SSCI, and AHCI), compared to 57.5% of society-published journals and 30% of research organisation-published journals.

The prevalence of ESCI in research organisation publishing is also evident in collaborator involvement (See Fig 6-b). When research organisations participate in publication processes, ESCI indexing rates are higher. Statistical test results confirm a significant difference in indexing patterns for stakeholders ($\chi^2(18)=2472.123, p<0.001, V= 0.199$).

⁶ <https://clarivate.com/products/scientific-and-academic-research/research-discovery-and-workflow-solutions/webofscience-platform/web-of-science-core-collection/editorial-selection-process/editorial-selection-process/>

⁷ Only four indexes (SCIE, SSCI, AHCI and ESCI) were considered for the statistical test. The journals that are indexed in two or more indexes were excluded from the analysis.

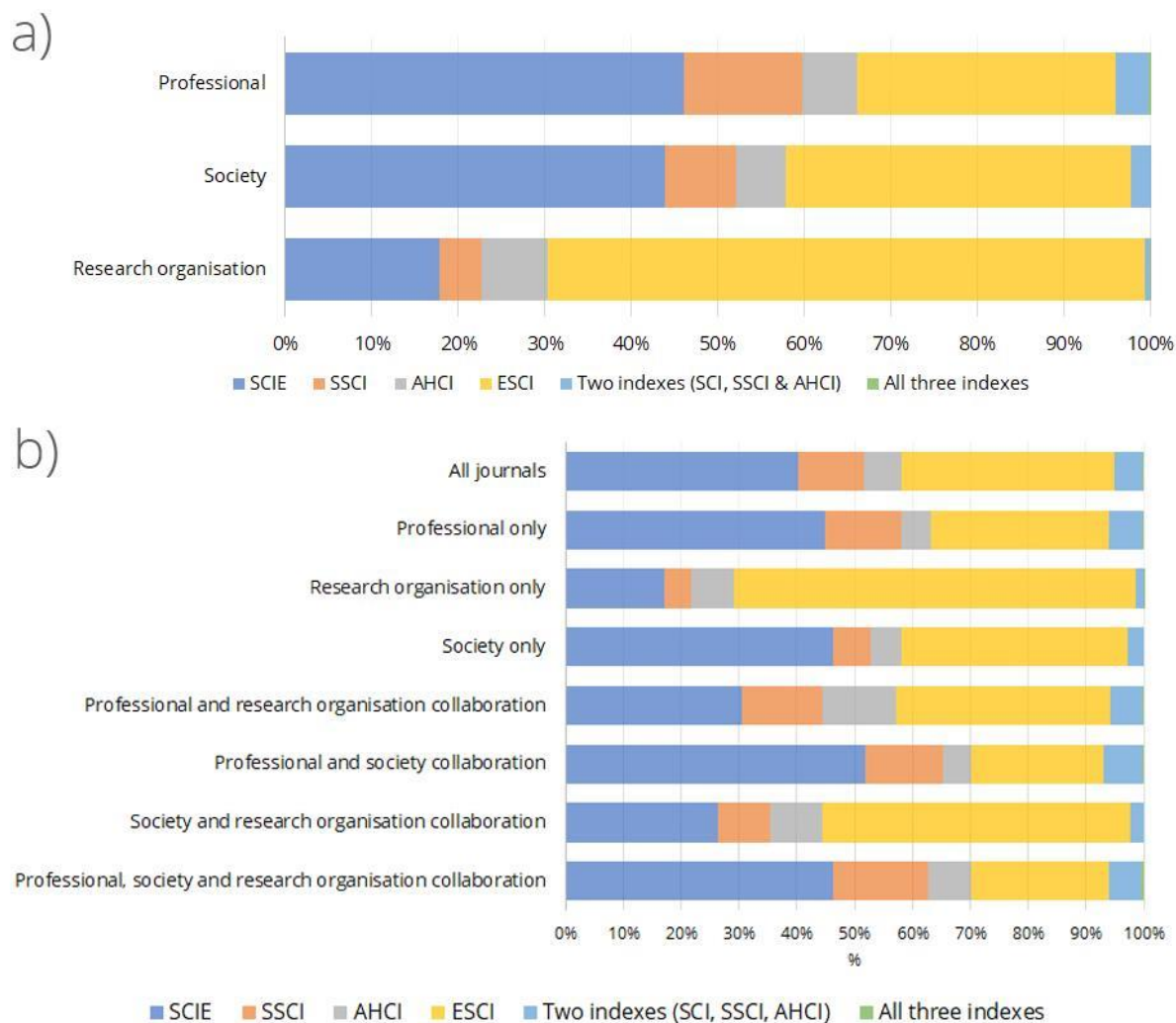


Figure 6. a) Indexing information of journals categorized by publisher types. b) Distribution of collaborators in journals and the WoS indexes

Publisher and collaboration types are shown above to have language, region, field and indexing specific journal profiles, so we also investigate if these patterns result in predictable differences in productivity, impact, collaboration and open access patterns of the respective journal landscapes. More specifically, we expect professional publishers - with stronger focus on STEM and English language publishing - to have advantage in terms of productivity and citation impact, international collaboration and smaller share of Open Access content compared to the other types. At the other end of the spectrum, research organisation publishers - with stronger focus on SSH and language diversity - can be expected to display opposite patterns.

4.6. Bibliometric analysis of journals

Figure 7 presents the main bibliometric indicators of journals. Journals led by professional publishers exhibit higher publication rates and larger shares of cited documents. The average number of articles per journal between 2018 and 2022 is 828 for professional publishers, 514 for societies and 259 for research organisations. Similarly, citation rate per journal is 9.3 for professional publishers, 6.3 for society publishers, and 3.1 for research organisation

publishers. We also checked self-citation rates, and they are nearly identical across the three publisher types. The Kruskal-Wallis test confirms significant differences in the number of documents ($H(2)=1503.665$, $p<0.001$, $\eta_H^2=0.068$) and the number of citations ($H(2)=3581.848$, $p<0.001$, $\eta_H^2=0.164$) across publisher types. Further pairwise comparisons using the Mann-Whitney U test for all groups yield statistically significant differences.⁸

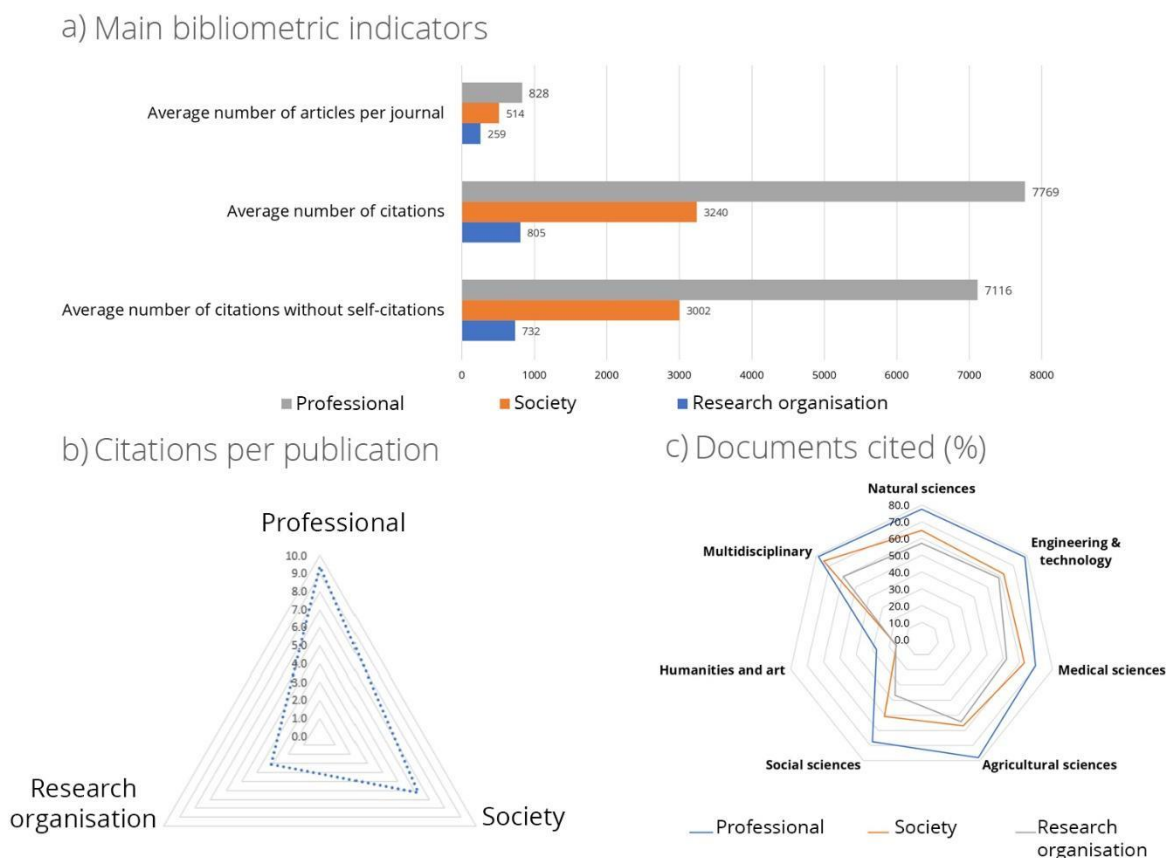


Figure 7. Main bibliometric indicators for journals of different types of publishers

The rate of cited documents is a crucial indicator for revealing the citation potentials of journals. Our findings indicate that professional publishers achieve the highest citation rate at 68%, with society publishers following at 56.3%, and research organisation publishers at 38.8% (See Fig 7). This difference is statistically significant ($H(2)=3161.827$, $p<0.001$, $\eta_H^2=0.144$). The results reveal that journals led by professional publishers enjoy both a publication and citation advantage, contributing to their prestige in research evaluation systems. However, a holistic understanding of our results emphasizes the importance of delving into the dynamics of different publishing ecosystems. According to Figure 8, when the language of the journal is English, the differences between publisher types are relatively

⁸ U: Sum of the ranks of the groups, Z: Z score.

In terms of number of WoS documents

Professional-society: $U=12825308.5$, $Z=-11.721262$, $p<0.001$, $rG=0.164$, **professional-research organisation:** $U=18063193$, $Z=-38.170$, $p<0.001$, $rG=0.400$, **society-research organisation:** $U=2655589.5$, $Z=-15.198$, $p<0.001$, $rG=0.247$.

In terms of times cited

Professional-society: $U=11128002.5$, $Z=-19.613047$, $p<0.001$, $rG=0.274$, **professional-research organisation:** $U=11632566.0$, $Z=-58.505$, $p<0.001$, $rG=0.613$, **society-research organisation:** $U=2195743.000$, $Z=-23.196$, $p<0.001$, $rG=0.377$.

smaller, with most articles being cited across professional, society, and research organisation publishers in each main field. However, when the language is multilingual or other, citation rates decline, particularly for journals published by societies and research organisations, though professional publishers still show stronger citation distributions compared to other publisher types. Notably, there is a parallel between Latin and North American non-English journals published by research organisations, indicating that the geographical bias often discussed in relation to North American journals does not apply uniformly; it primarily affects journals led by professional publishers.

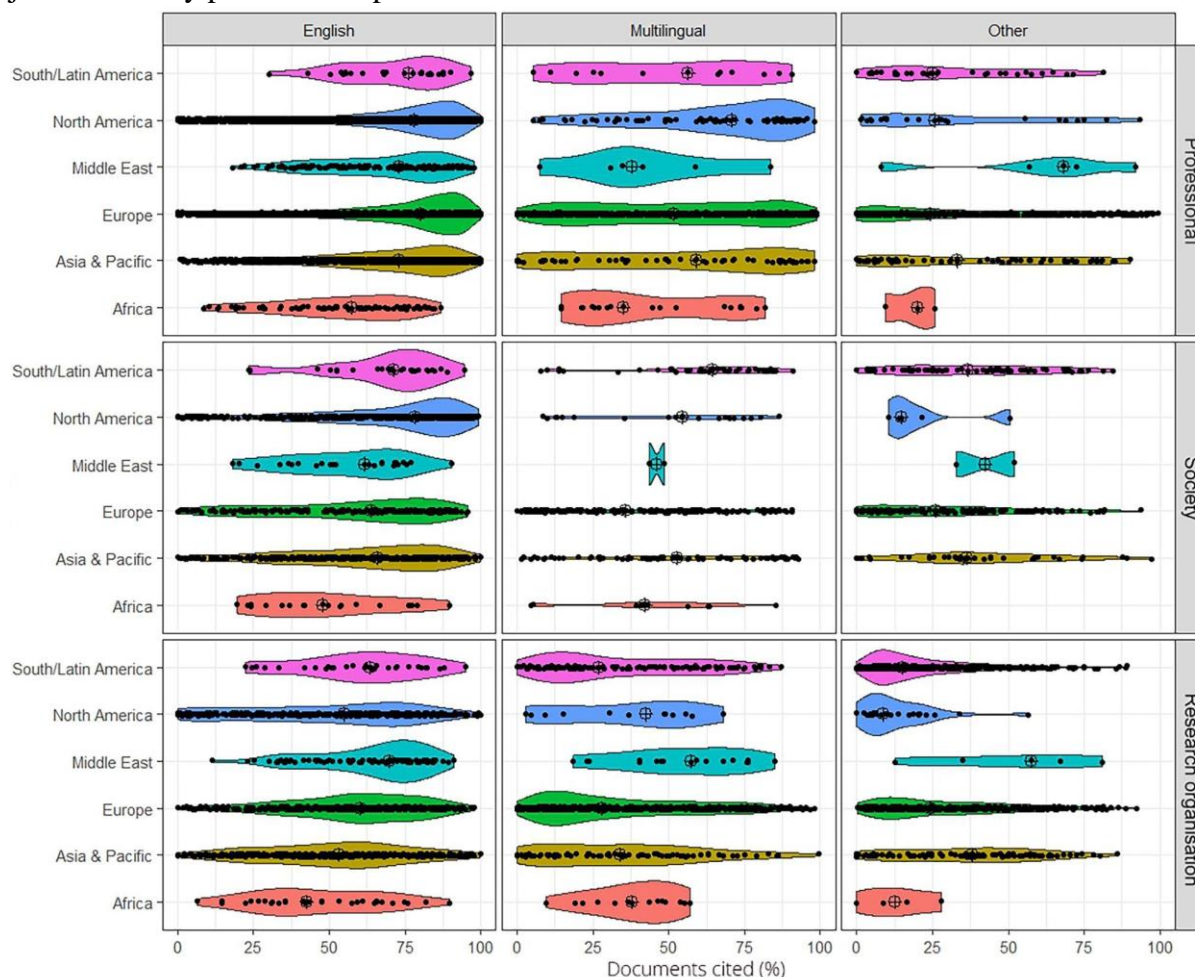


Figure 8. Regions, languages and publisher types and their effect on documents cited

4.7. Domestic and international collaborations of authors

The analysis of domestic and international collaborations provides valuable insights into the role of publisher types in shaping co-authorship patterns. While journal publishers are not typically viewed as primary determinants of collaboration types, our study investigates this overlooked aspect to understand if and how publisher types influence the propensity for domestic versus international collaborations. By examining these patterns, we aim to reveal potential underlying dynamics that connect publisher types with collaboration networks, thereby contributing to a more comprehensive understanding of the scholarly publishing landscape.

Taşkın, Z., Pölönen, J., Kulczycki, E., & Laakso, M. (2025). Mapping the publisher types and collaborations behind Web of Science indexed journals. *Quantitative Science Studies*. Advance Publication. <https://doi.org/10.1162/qss.a.14>

An interesting distribution was found for international and domestic collaborations (See Fig 9). While international collaboration rates are highest for professional publishers (20.3%), society publishers exhibit higher domestic collaboration rates than the others (29.3%). The difference is statistically significant for both domestic ($H(2)=649.296, p<0.001, \eta_H^2=0.029$) and international collaborations ($H(2)=1675.197, p<0.001, \eta_H^2=0.076$). Figures 10 and 11 elucidate the sources of differences in terms of regions and languages. No significant difference is observed between Europe and North America's publisher types concerning international collaborations. However, the results for domestic collaboration reveal intriguing patterns. Asia-Pacific countries demonstrate distinctive domestic collaboration patterns, particularly in non-English and society-led journals. Additionally, the Middle East shows potential for domestic collaboration in research organisation and society journals. These findings collectively suggest that the domestic diversity of the scholarly communication ecosystem is predominantly provided by research organisation and society journals in peripheral countries. Further analysis is needed to comprehend all dimensions of the ecosystem.

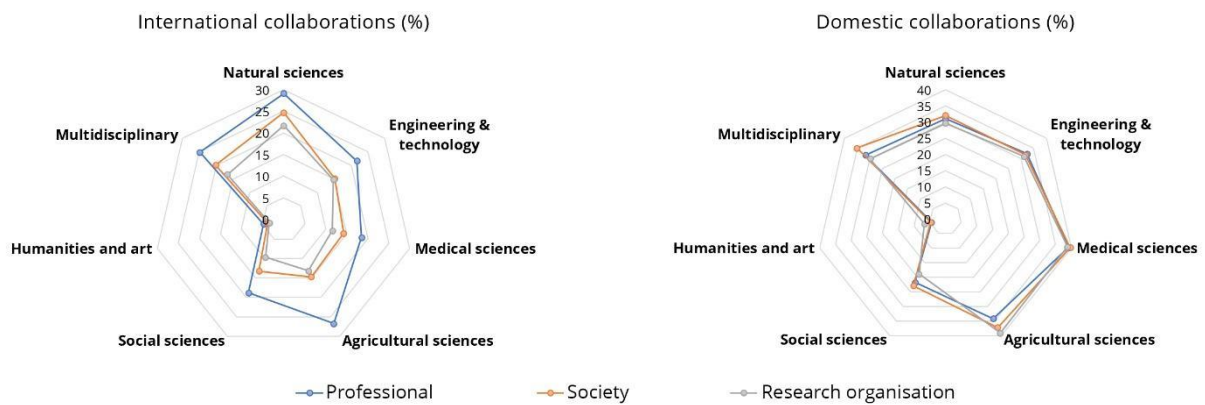


Figure 9. Domestic and international collaboration rates (co-authorship based)

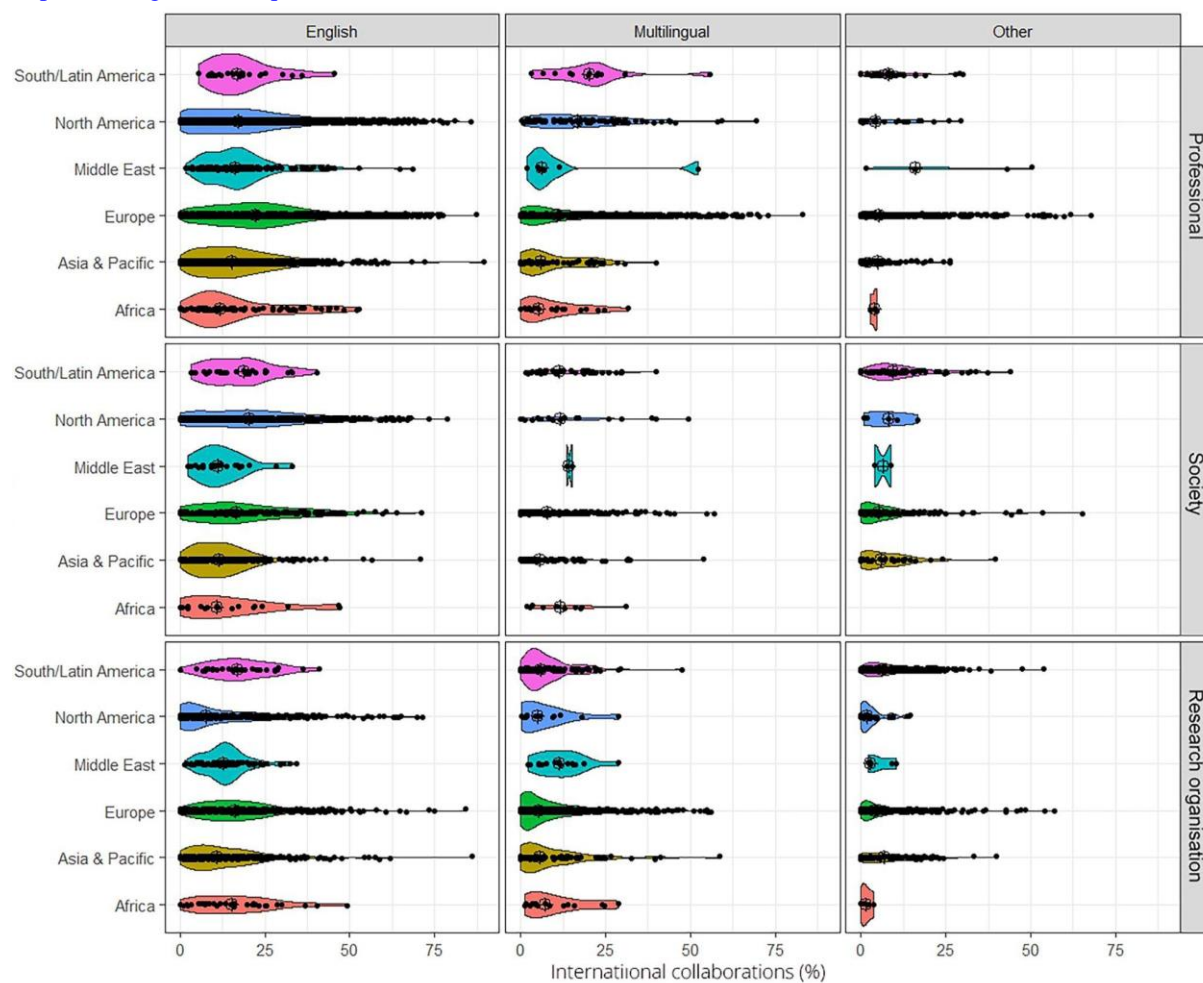


Figure 10. Regions, languages and publisher types and their effect on international collaboration rates

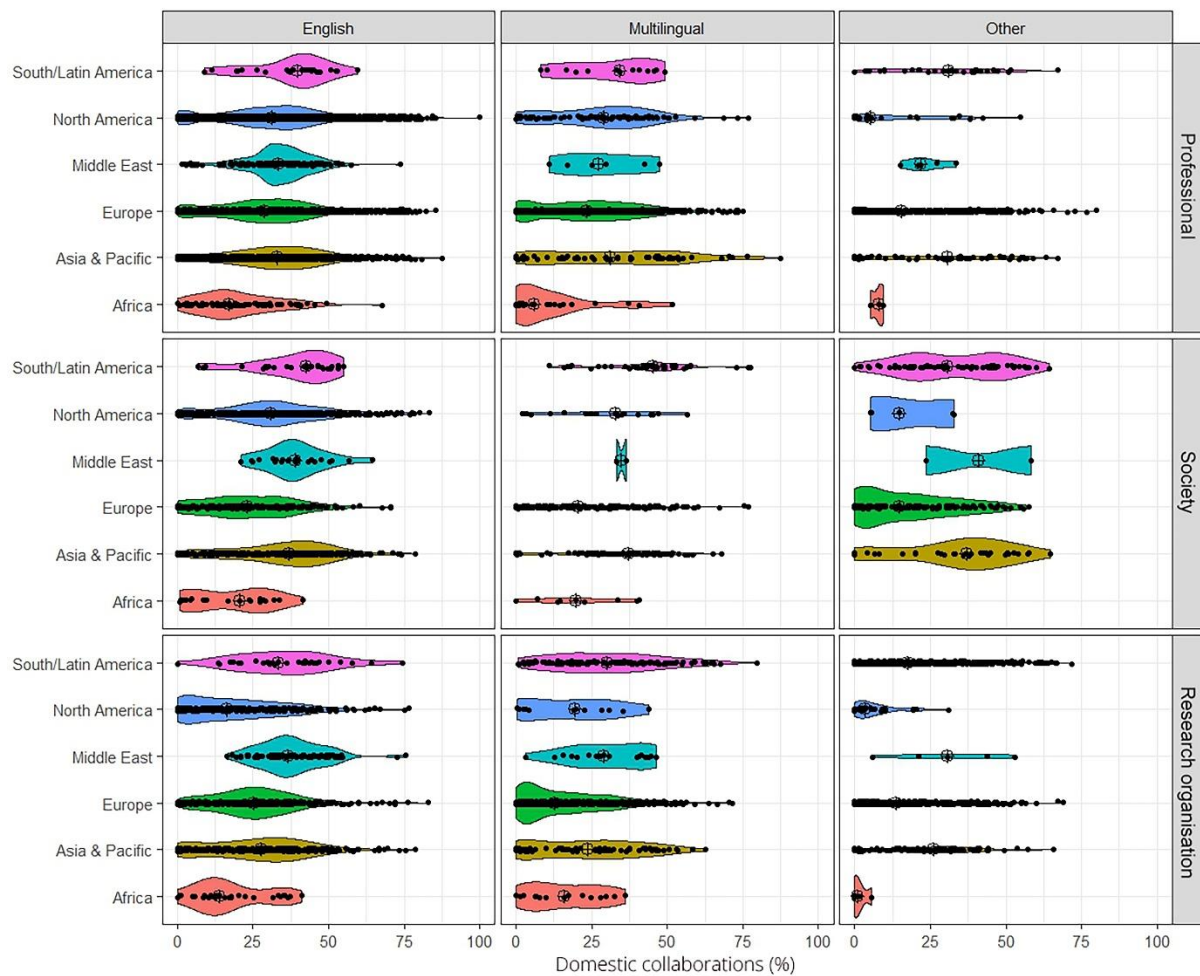


Figure 11. Regions, languages and publisher types and their effect on domestic collaboration rates

4.8. How open are these journals?

Being openly available is crucial for journals, as it significantly impacts their visibility and the number of citations they receive (Eysenbach, 2006). Our results reveal that publisher types influence the open-access rate ($H(2)=53.264$, $p<0.001$, $\eta_H^2=0.002$). In Figure 12 and 13, the relationship between regions, languages, publisher types, and open-access rates is depicted. South/Latin America stands out with fantastic open-access rates across all types and languages, possibly reflecting the positive impact of initiatives like SciELO⁹ and AmeliCA.¹⁰ Noteworthy is the unavailability of content published by professional publishers from North America and Europe. Despite being the starting point for many open-access movements, the content produced by these countries remains inaccessible.

⁹ <https://scielo.org/en/>

¹⁰ <https://amelica.org/index.php/en/home/>

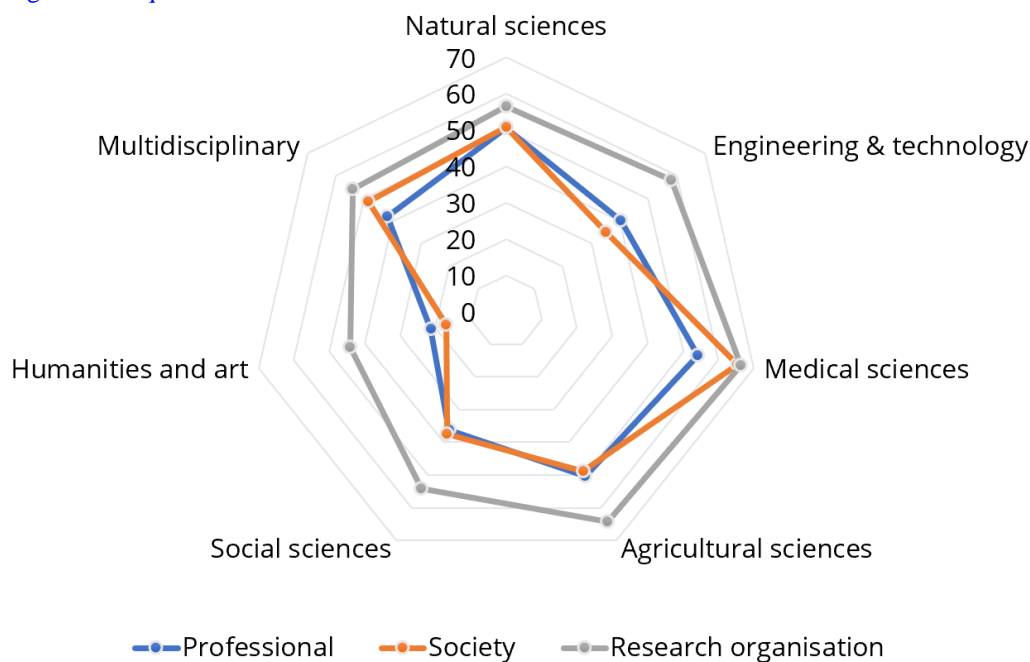


Figure 12. Open access rates of publisher types and its distribution of subject categories

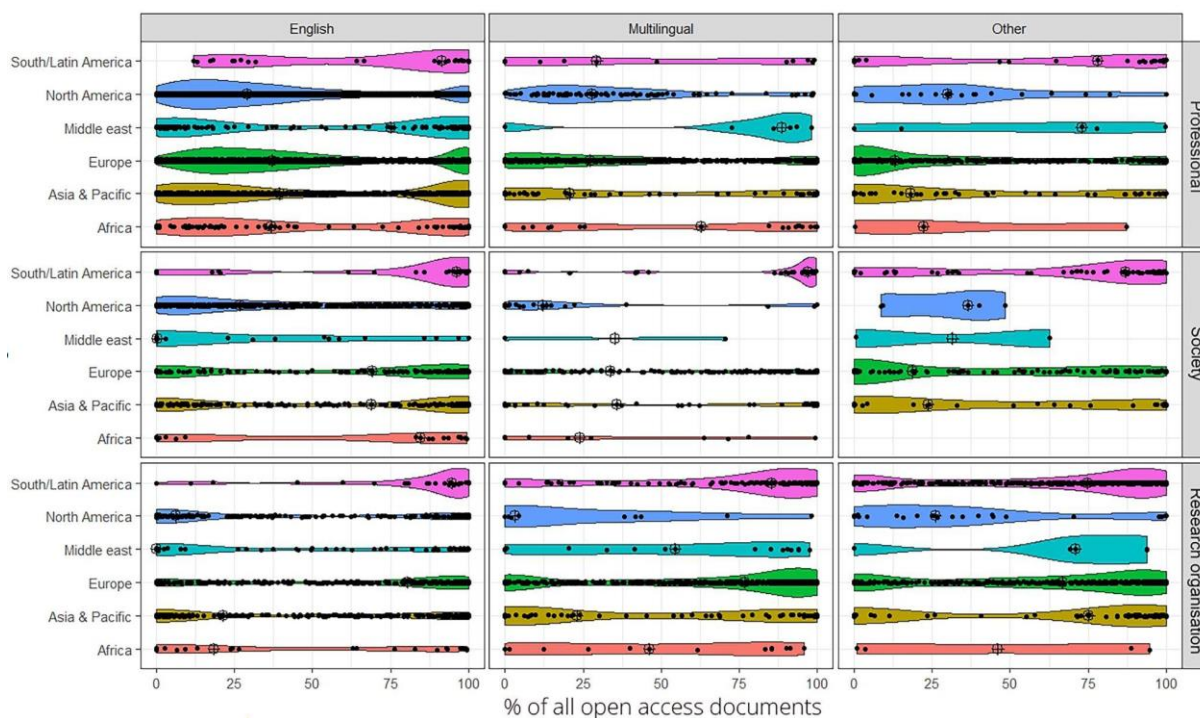


Figure 13. Regions, languages and publisher types and distribution of the rates of all open access documents

5. Discussion

The aim of this study was to explore different publisher types (professional, society and research organisation) and their cross-collaborations in the dissemination of research outputs. We sought to uncover patterns and practices of scholarly publishing across different regions

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and languages by studying how publisher organisation information is related to multilingual publications and regional publishing practices.

By differentiating 21,886 WoS-indexed journals according to organisation type (professional, society, research organisation), our study shows a landscape of international journals largely dominated by professional (mostly commercial) publishers. The finding that almost three-quarters of WoS-journals are published by professional publishers is consistent with several studies that have underscored the oligopoly of the few and large commercial publishers (Larivière et al., 2015). Our analysis, however, complements this picture by taking into account smaller professional publishers, and by showing that around 17% of the journals are published by research organisations and 9% by learned societies.

Moreover, our analysis also refines the existing picture of the international journal landscape by uncovering the role of collaboration between different publisher types, as roughly one-third of all journals, and 43% of those of the professional publishers, are published in collaboration with other organisations. Taking into account the collaboration shows the broad engagement of learned societies and also research organisations in collaboration especially with professional publishers. Taking into account collaboration, professional publishers are involved in three-quarters of the WoS-indexed journals, while societies play a role in 29% and research organisations in 28% of the journals. While we have been able to indicate that collaborations exist, we have not been able to analyse the different forms, roles and tasks involved in those collaborations which could be interesting for future research to explore further.

With regard to collaborations, it has been thoroughly analysed and documented how society publishers have increasingly outsourced their publishing operations to professional publishers, especially in the UK (Fyfe, 2022). Our analysis shows that particularly in Europe, the share of journals self-published by societies is relatively small compared to journals published by professional publishers in collaboration with societies (Figure 3). In North-America, for example, society self-publishing plays a more prominent role compared to self-publishing by, or society partnership with, professional publishers. It is important to remember, however, that the world of WoS is predominantly one of international English language journals. Outside of WoS, in many European countries learned societies play an important role in publishing national language journals (Late et al., 2024), without interest or involvement of professional publishers (Late et al., 2020).

Our analysis also revealed significant regional patterns in publishing practices, particularly in the Asia-Pacific and Latin American regions. In the Asia-Pacific, the strongest relative presence of society-led publishing was attested. This finding aligns with Pawar (2010), who emphasized the importance of community development practices in both developing and developed nations within the region. The need for tailored, locally relevant research outputs may drive the prevalence of society-led journals in this area, as these journals are often better positioned to address specific community needs than commercial publishers.

Similarly, the prominence of Latin American contributions to scientific production, historically supported by research organisation-led publishing without article processing charges (APCs), provides context for our findings in this region. Mounier (2023) highlighted the role of these research organisation-led initiatives in sustaining robust academic output in Latin America, despite economic constraints that might otherwise limit access to global publishing platforms. This model of publishing not only supports local research agendas and communication in Spanish and Portuguese languages but also ensures broader access to

Taşkın, Z., Pölonen, J., Kulczycki, E., & Laakso, M. (2025). Mapping the publisher types and collaborations behind Web of Science indexed journals. *Quantitative Science Studies*. Advance Publication. <https://doi.org/10.1162/qss.a.14>

scientific knowledge. Also in the Middle-East and Africa, WoS-indexed journals depend more on research organisation publishers and societies than the professional publishers.

One of the key findings of this study is the scarcity of multilingual publications among professional publishers and stronger focus on STEM fields. This trend can be interpreted in several ways: it suggests that journals publishing in languages other than English may not attract the interest of professional publishers, potentially due to the limited global reach and lower citation impact of non-English publications. The dominance of English as the lingua franca of science further reinforces this trend, as both researchers and publishers prioritise English-language outputs to maximise visibility and influence within the global academic community. This is an area that warrants further investigation to understand the motivations behind these publishing decisions and to explore strategies for promoting linguistic diversity in scholarly publishing.

While this study provides a comprehensive analysis of the publishing landscape based on the WoS database, certain limitations must be acknowledged. The WoS index is known for its bias towards English-language journals and publications from Anglophone countries, which may result in under-representation. Consequently, the bibliometric indicators used in this study may be less consistent for journals outside the dominant English-language publishing sphere.

To address these limitations, our research team is currently expanding the scope of the analysis by utilizing data from the ISSN Portal, which offers the most comprehensive and diverse journal metadata available. Additionally, ongoing projects such as DIAMAS and ALMASI are focusing on enhancing the representation of non-Anglophone journals and improving metadata standards globally. Future research will leverage these resources to develop a more balanced and inclusive understanding of the scholarly publishing landscape.

This study provides valuable insights through bivariate analyses between publisher types and other variables such as region, language, and indexing. However, a multivariate analysis could further unravel the complex relationships between these factors. As a direction for future research, we plan to develop a regression model to examine the effect of publisher type on the number of citations per publication. The primary objective of this future study is to determine whether the type of publisher—be it commercial publishers, university presses, or scientific societies—significantly influences citation impact. By incorporating multiple variables such as region, language, and indexing status, this analysis aims to provide a more comprehensive understanding of how these factors interact to shape citation patterns in the WoS. This approach will help address the gaps identified in the current study and offer deeper insights into the scholarly communication landscape.

In conclusion, the regional and linguistic patterns observed in this study underscore the importance of considering both local and global contexts in scholarly publishing. The implications of these findings extend beyond the scope of this study, suggesting avenues for future research and policy development aimed at promoting linguistic diversity and regional representation in academic publishing.

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