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On “Scientific Imperialism”

Ye.V. Popov, N.G. Popova, and D.M. Kochetkov

Abstract

The article discusses the use of various institutions of scientific imperialism, including the institution of publishing academic articles in English, the institution of standardizing how research should be reported, and the institution of indexing of articles in two global databases. We show that the establishment of institutions of scientific imperialism entails a number of negative trends: slowing down the publication of articles, the loss of a national research culture, and formulating and presenting research results to fit the requirements of indexing databases. We identify possible approaches to mitigate the negative effects associated with the expansion of the institutions of scientific imperialism.

The rapid advances in the knowledge society spur the formation of various economic institutions that regulate the domain of academic research and development. We are talking about established norms governing relations between participants in the economy when there is an external entity monitoring the implementation of these norms. Moreover, a number of these institutions have developed in tandem, and they have combined to make up the phenomenon of “scientific imperialism,” whereby certain practices monopolize research. This phenomenon has both positive and negative effects. It is important to note that the negative consequences of the development of scientific imperialism have not been adequately studied previously by scholars.

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The formation of scientific imperialism

The concept of scientific imperialism was articulated to explain the horizontal expansion of a certain set of research approaches to describing the world in preference to others. Michael Friedman articulated the theory of a unified research method when he proposed reducing the entire immense set of objects making up the material and intangible worlds to the objects that are already known and studied [12]. His ideas were developed by Philip Kitcher, who proposed applying unified patterns for explanation and argumentation in various academic fields [17], thereby prompting the need for a horizontal expansion of research methods.

Criticizing the findings of Friedman and Kitcher, John Dupre has argued that “scientific imperialism” is unable to explain a wide range of phenomena [10]. He noted that the use of a single concept to explain various phenomena outside their domain significantly reduces the explanatory power of such a concept; that is to say, according to the author, it is not justified.

Steve Clarke and Adrian Walsh have compared scientific imperialism to political imperialism and identified it as the usurpation of one research domain by another [8]. Uskali Mäki has identified three categories of scientific imperialism [19]:

- Imperialism of one field over others (an expansionist academic discipline seeks to explain phenomena belonging to the field of another discipline);
- Imperialism of style (the methods, standards, and research styles typical of one discipline are transferred to other disciplines);
- Imperialism of position (the academic prestige, power, resources, and use of cutting-edge technology are transferred from one discipline to other disciplines).

Sometimes, including in particular in medicine, the term “scientific imperialism” is used when considering the ethical component of a research study. This approach raises the problem of the globalization of the methods that are used to diagnose and treat patients [7]. Thus, Peter Wilmshurst argues that if people from third-world countries cannot afford to use a specific medicinal product following the completion of a clinical trial, this remedy should not be propagated for universal treatment [26].

There are a number of terms having a similar meaning. For example, “academic imperialism” is understood as the export of educational and academic institutions to other cultures [23]. The main problem is the concentration of ownership of the academic publishing market in the hands of a few multinational corporations. Glen Lewis has similarly analyzed the

oligopoly of academic publishers in Australia, and he has labeled this state of domination as academic imperialism [18].

Let us mention that, even in his initial papers on academic imperialism, Norman Friedman noted that the individuality and freedom inherent in academic culture has resulted in less intensive cooperation than what is encountered in traditional social movements [13]. More modern works have observed that academic imperialism has been applied in a non-uniform fashion. Thus, Craig Prichard believes that the history of research and the location where research is performed are important factors to be considered in this phenomenon: “Music is universal, but its sound is dependent on the place where it is performed” [21].

It has been claimed that the phenomenon of economic imperialism has influenced Russian articles in economics more broadly. Economic imperialism refers to the active use of economic concepts, including primarily the concepts of economic efficiency [1]. In this case, the dilemma of the choice between monopoly and pluralism in science always arises [3].

Thus, to date, scientific imperialism has been manifested in the development of the institution of English-language academic publishing, in the standardization of how research results should be formulated and presented, and in the establishment of article indexing in world databases.

Institution of academic publishing in English

At the present time, English unequivocally dominates the world of science and information by virtue of the fact that it is the dominant language of communication in these fields. According to various sources, more than 90 percent of the world’s academic research is published in English. According to the Scopus abstracts database, the proportion of English-language academic articles published in European countries is many times higher than the proportion of academic articles in all of the other respective national languages. There has been a particularly rapid and notable increase in the number of English-language articles in the Netherlands, Italy, and Russia.¹ For example, in the Netherlands, the leading country by share, this ratio is 40:1. Moving beyond statistics about the individual academic articles themselves, about 80 percent of all academic journals indexed by Scopus publish content entirely in English. Moreover, according to the analytics firm SCImago Journal Rate, the world’s leading 50 journals not only publish English-language content, but their publishers are located in either the United Kingdom or in the United States. There is no evidence to the contrary that the number of English-language journals will continue to grow by displacing journals published in other national languages.

The use of English as a tool for academic communication has engendered a lot of debate. At the one end of the debate are the supporters of advancing

this institution still further because they view English as an academic *lingua franca*. They note that in the context of the snowballing growth of information throughout the world, the use of a common language may be the only effective way of ensuring the recording, storage, and processing of and access to large amounts of information [14]. Improving information management should, in turn, facilitate the development and promotion of scientific knowledge in general [28].

Moreover, David Crystal, who has analyzed how English functions as a global language, insists that the international community speaks in a kind of “sterilized” language that is devoid of cultural identity, which means that it in no way constitutes a threat to the world’s linguistic and cultural diversity. In his opinion, English has not only come to be widely used as a neutral and natural medium by its nonnative speakers, but they have been additionally able to readapt it to fit their needs [9].

At the other extreme, critics voice warnings about the political, economic, axiological, and even existential threats that are posed by the dominance of a single language [26]. In 1992, the British academic Robert Philipson published the book *Linguistic Imperialism*, in which he gave a detailed account of how one language comes to dominate over others. In summarizing the contributions made by previous authors who had studied issues surrounding cultural discrimination, sexism, neo-colonialism, and imperialism, he not only provided a definition of linguistic imperialism, but he also classified it across different parts of society. Thus, he drew a distinction between the concepts of “linguism” (a word formed by analogy with racism and sexism) and “linguistic imperialism.” In the first case, a language is used in a society to maintain social inequality and the dominant positions of individual social actors. Linguistic imperialism, by contrast, is linguism in action when the behavior of these actors is supported by an imperialistic structure that is specifically designed to help one society exploit another. According to Philipson, the global dominance of the English language results in the creation of a language hierarchy, leading to the demise of other languages and deepening inequality worldwide [20].

In his analysis of the sociolinguistic status of the English language in the Russian educational space, Yury Kobenko came to the conclusion that it operates as an imported metalect, that is, the national language of a colonizing power becomes the main language of the colonized society [4]. This author distinguished attributes of the use of English for the purposes of colonization that can also be fairly applied to the analysis of scientific communication.

One such attribute is that there are no alternatives to the use of the language, that is, students are forced to study it. Indeed, at present, in academia (in almost all countries) knowledge of the English language is becoming the key not only to career advancement, but just to maintaining

one's job, because to extend your contract you must publish research that is indexed in international databases. In other words, we argue that researchers have no free choice of where and in what form they can publish their research results. The second attribute of language colonialism is that the language displaces other languages from the territory where it is dominant. Unfortunately, the adoption by the ruling Russian elites of the Bologna Process has led to the abolition of the teaching of foreign languages other than English. German and French, foreign languages that were traditionally taught to Russian graduate students, are no longer studied by them today [6]. This leads us to the third attribute, or the use of the colonizer's language to achieve ideological goals, when it is implanted in the periphery to serve the political and economic interests of the "center." An excellent example is the English-language academic publishing business, which manages to achieve profit margins that are on a par with those of innovative high-tech companies. Thus, in 2014, Elsevier Publishing and Springer achieved profitability (profits measured as a percentage of revenue) of 37 percent and 35 percent, respectively, whereas BMW had a profit margin of 10 percent and Apple had one of 29 percent.² In 2016, Thomson Reuters announced the sale of its scientometric subdivision for USD 3.55 billion. In other words, we are talking about the creation of an oligopoly in the academic publishing field where we know that such oligopolies always abuse their power to exert ideological control over the masses.

The following situations represent negative consequences of the institution that dictates that academic research must be published in English [26]:

- Reviewers reject articles solely on the basis of perceived shortcomings with the quality of the language.
- Editors exhibit a greater preference for authors with an "English-sounding" last name.
- Readers express greater interest in topics that are relevant to Anglophone societies.
- Authors exhibit a greater tendency to quote English-language sources because they perceive that this increases the likelihood that they will be able to publish their manuscripts.

Thus, on the one hand, we may conclude that the English language is not as culturally neutral and safe as is claimed by those who advocate for its spread as a lingua franca, and, on the other hand, we realize that we need to obtain a deeper understanding and awareness of the phenomenon of scientific imperialism as grounded in the institution to publish academic research solely in the English language.

The formation and implementation of the institution of standardized academic writing has played no less an important role in the development of scientific imperialism.

Institution of standardizing how research should be reported

The academic article has undergone a long evolution as a specific medium for the presentation of scientific knowledge. According to historians who have studied the development of the genre, as academic societies emerged and developed in the seventeenth century, they increasingly had to solve the problem of how scientists should exchange knowledge with each other. Thus, in the seventeenth century the first academic journals started to appear (*Journal des Sçavans*, *Philosophical Transactions*), where researchers not only had the opportunity to report their discoveries and inventions, but also to assert their claims to presenting original research. As a result, the form of scholarly texts, which had previously only been shared in letters exchanged with colleagues, also began to change, and they were adapted to serve the needs of the academic community [15].

The editors of academic journals began to formulate stylistic requirements for the authors of manuscripts, whose purpose now was to exclude amateurs and interested laymen from a desired target audience of experts working in increasingly specialized fields. According to this academic style, the language became more impersonal and utilized specialized terminology. Devices such as tables and graphs start to be used [16]. It is important to note that until the late 1920s, science was a multilingual pursuit: Articles were published in different languages, including French, German, Russian, etc., and the scientists themselves were polyglot.

Serious changes were made to the structure and style of academic articles in the twentieth century. The most important reason prompting these changes, in our opinion, was the information crisis of the 1940s. It was caused by the rapid growth in the volume of research and the emergence of inter- and multidisciplinary fields. Therefore, the problem of how to find information became acute.

A development of the 1960s sought to answer this problem: The American scientist Eugene Eli Garfield established the Scientific Citation Index, which basically sought to summarize all scientific information in circulation based on the frequency of its citation by other authors. Naturally, the more standardized the information, the easier it is to process using computer systems. We can assume that this is why the academic article (and not the monograph, for example) became the “basic unit of academic communication” or the standard means for distributing and evaluating research results as well as a critical factor for measuring career development in most disciplines. However, we should further

clarify that it was the English-language academic article that became such a “standard,” and it was starting basically from this period that science became “mono-lingual.” Let us for the sake of fairness note that studies in the area of scientometrics, which is the discipline that focuses on the standardization and processing of scientific information, were also actively pursued in the Soviet Union. However, it did not gain such widespread acceptance in the Soviet Union as did it in America due to the fact that cybernetics was not in favor under communism because it contradicted the official ideology of the time [29].

The studies of specialists in applied linguistics represented a key external factor that helped to further standardize the modern format of the academic article and expand it on a global scale. Their interest was to a large extent prompted by the attitude of “publish or perish,” which became widespread in the United States and European countries and led many authors to consider what an academic paper should look like in order to be published in a high-impact English-language journal.

The studies, which focused on different aspects of academic writing, such as the style and diverse range of texts, the rhetorical and communicative functions of various language elements and other aspects, led to many important findings concerning the structure and consistency of information in academic articles. These conclusions provided the grounds for establishing English language courses for specific academic purposes. These courses were included in master’s and postgraduate programs of study. As a result, the circle has been closed: The model that was identified on the basis an analysis of a large corpus of articles was broadcast as the ideal model to be followed.

This IMRAD article model, which was initially followed by researchers in the natural sciences, including in particular medicine, soon became the dominant model for almost all academic fields. An IMRAD format article is organized into the following sections:

- Introduction
- Materials and methods
- Results and
- Discussion

Thus, this model provides an ideal structure that describes the logic of the presentation of information in an academic article. This model is currently actively promulgated in many textbooks on academic writing. The basic principle of the exposition is founded on the fact that the article sections are relatively independent of each other. A reader of a modern English-language academic article can start with virtually any section, because each

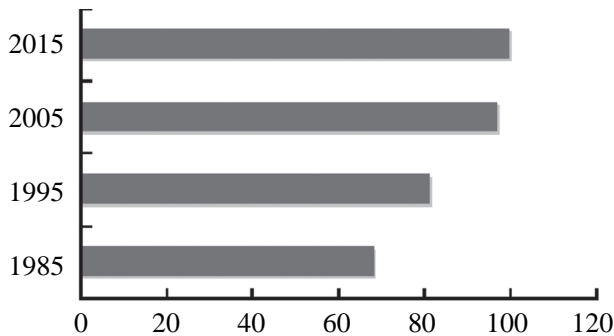


Figure 1. Use of the IMRAD Format over Time Since 1985 in Chemistry According to the Scopus Database.

one presents a separate microtext. Even the keywords and the title are today considered the most fundamental aspects of the text.

Figure 1 shows how the IMRAD format for academic articles has gained popularity over time in the field of chemistry among researchers who do not speak English as their native language. The results demonstrate that by 2015 almost all articles published in journals indexed in the Scopus database were formatted in accordance with the IMRAD model. Interestingly, a similar trend can be observed in the social sciences and even in the humanities.

Certainly, there is nothing inherently wrong with the IMRAD format: The logic of the text fully replicates the process of scientific research, as it states the scientific research questions, then selects the needed tools to solve the problem, captures the results of the study, and then draws conclusions from them. In addition, such an order for the presentation of scientific research results makes it possible to formalize and standardize the presentation of scientific knowledge. As a result, it has become faster and easier to search for and retrieve information. These developments have become essential for the proper functioning of science in the big data era. Thus, the use of a unified format is consistent with the imperative of practicing universal standards in science. However, along with the obvious positive effects, this model also presents a serious threat to the unique ways that researchers can understand reality that are specific to their culture. We will now explore these concerns in more detail.

One of the dangers of making formatting standards for academic articles more rigid is that any such standardization can have a negative effect on creative thinking. On the one hand, standards, formulaic language, and stereotypes enable society to structure reality and develop those models of behavior that will be regarded as standards for its members to follow. As a result, people are freed from having to make decisions in situations where the standard applies, thus optimizing the use of scarce resources. Thus, the

availability of a convenient and simple set of instructions for writing a text genuinely maximizes a researcher's available time for conducting experiments. On the other hand, it is not a mistaken view that standardization is contrasted with creativity and thinking outside of the box. Creativity is based on a non-standard vision. It departs from traditional forms of thinking and seeks out non-obvious solutions to complex problems. Thus, it is by definition contrary to the principle of bureaucracy. And, because proposing an idea and the generation of a text are inseparable processes, the standardization of the writing of texts may entail negative consequences for the thinking process itself [11].

The dissemination of the IMRAD format throughout the academic world has spurred a huge increase in the volume of published academic articles. For example, in Russia, the number of articles indexed in the Scopus database grew from 32,500 in 2012 to 41,200 in 2014.

However, the most impressive growth in the number of published articles has been observed in China. Between 1996 and 2010, China's relative share of the total international volume of academic research increased from 2.6 to 16.3 percent [5]. It should be noted that the internal Chinese policy in the area of science and education is focused not only on encouraging academics to study academic English but also on recruiting experts in this area to work at Chinese universities.

However, according to many analysts, the increase in the total volume of academic publications has not had a significant positive effect on the quality and depth of research. However, when scientists judge the quality of their content, they are concerned that many academic articles that are being published today do not meet the standards of the scientific community [22]. In other words, although many of these articles fully comply with the outward organizational requirements for an academic article, they fail to convey a deep understanding of the results of scientific research. They instead read like procedural reports. Although these texts can be conveniently speed read because they follow conventions, they often fail to sustain honest and enriching dialog between scientists: instead, contemporary writing practices increasingly reflect the new image of the researcher as someone who shirks responsibility and eschews self-doubt. As a result, much of the powerful growth of scientific knowledge may consist of work that is never sufficiently theoretically thought through and reflected upon.

Another consequence of the trend to write academic articles in accordance with templates is the loss of an original "authorial voice" and, consequently, of the cultural identity of the text. Many of today's articles that are written by non-native English speakers are virtually indistinguishable from each other: They use the same formulaic phrases and similar argumentation. It should be noted that native speakers write in different styles, taking advantage of the full

range of academic English to convey their points. Naturally, during the reviewing process, these articles by native speakers will be more likely to receive a positive review by the editors of academic journals.

Thus, the following points are just some of the negative consequences of instituting standardized forms for presenting academic research:

- Authors avoid pursuing creative solutions to complex scientific problems.
- Authors unduly focus on a description of research procedures to the detriment of the articulation of the research problem and a discussion of cause-and-effect relationships.
- Articles are stripped of their cultural identity.

The proliferation of research resulting from the institution of the convention to publish academic research in English and the standardization of academic writing has resulted in the economic institution of indexing articles in two global databases.

Institution of indexing articles in the WoS and Scopus databases

Researchers during the mid-twentieth century noticed an exponential increase in the amount of scientific information, which prompted them to seek out ways of systematizing it and evaluating the quality of the source. The international citation databases have become the primary tools for the ordering and filtering of information. In 1958, Eugene Garfield began publishing *Current Contents*, which was the first index of scientific periodicals in paper form. *Current Contents* (which is currently known as *Current Contents Connect*) is a database of full-text articles, abstracts, and metadata from the recently published issues of leading scholarly journals.³ It featured an alphabetical index and a keywords index. It also listed the addresses of the authors so that readers could request preprints from them. In 1992, the service was acquired by Thomson Scientific, which, in turn, merged with Reuters in 2008 to form Thomson Reuters. During the 1970s, *Current Contents* grew into the Web of Knowledge abstract database (which is currently known as Web of Science).⁴ The basis of the system is the Web of Science Core Collection, which consists of the Science Citation Index Expanded (SCIE, covering approximately 8,500 major periodicals in 164 scientific disciplines), the Social Science Citation Index (SSCI, indexing 3,000 periodicals covering 55 disciplines), the Conference Proceedings Citation Index and the Arts & Humanities Citation Index (A&HCI, indexing 1,700 periodicals).

Towards the turn of the 21st century, Elsevier, which is the largest international academic publisher, created a rival abstracts database, Scopus, which offers broad coverage of international research in the fields of science, technology, medicine as well as the humanities to a lesser extent.⁵ Updated daily, Scopus indexes references and abstracts to articles published in over 21,500 peer-reviewed journals from more than 5,000 international publishers. Besides performing the function of systematizing academic papers, databases of abstracts allow users to evaluate the state of academic research activity. The h-index, which was proposed by the American physicist Jorge Hirsch, is most frequently used to evaluate the importance of the contributions of individual academics. A scientist has an h-index equal to h if h of his N_p articles have at least h citations each, and the rest ($N_p - h$) have no more than h citations. Many articles that satisfy this criterion are classified in the h-core group [2].

The classic tool that is used to assess the influence of an academic journal is its impact factor. This indicates the average number of citations per article in a journal. It is calculated using the formula $IF = C/N$, where C is the number of citations that is received by a particular journal for articles published over a certain period of time and N is the total number of articles that are published in the journal during the same period. The typical period (publication window) that is used to calculate the impact factor is two years. A five-year impact factor is also calculated.

These tools are undoubtedly important for providing an objective quantitative assessment of academics, academic journals, and universities. However, the problem lies in the fact that this evaluation and all decisions that are made on its basis (e.g., decisions about resource allocation) are based solely on the two indicated databases. We are seeing exactly this process taking place in Russia today. The concentration of all evaluation tools in the hands of two companies leads to the monopolization of the academic publication market and distorts knowledge generating transactions between research teams.

We illustrate this position based on the example of the distribution of academic articles by country in the major subject categories of the Scopus database. Data was taken for the time period 2011–2017. The Herfindahl-Hirschman Index (HHI), an industry-specific market analysis tool, was used to conduct the analysis:

$$HHI = S_1^2 + S_2^2 + \dots + S_n^2,$$

where S_1, S_2, S_n is the ratio of the number of academic articles in a given country to the total number of articles in the subject category. It is also possible to estimate what proportion of published articles were written by scholars from the five leading countries by subject category:

Table 1. The Distribution of Indexed Academic Articles in Five Major Countries by Main Subject Areas in the Scopus Database, 2011–2017

Subject category	Number of academic articles	HHI	CR, %
Agricultural and biological sciences	1,232,302	1,001	54.17
Chemistry	1,331,085	1,177	61.26
Engineering	3,189,378	1,361	61.31
Mathematics	1,035,853	1,076	59.12
Social sciences	1,421,736	1,252	61.28
All categories	16,350,114	1,069	59.85

Source: Elsevier's Scopus electronic database.

$$CR = S_1 + S_2 + S_3 + S_4 + S_5.$$

The results of calculations are presented in Table 1. Academic fields with the largest number of published articles were selected as the main subject areas.

The results presented in Table 1 demonstrate that the academic publication market is an oligopoly, i.e., the top five countries account for about 60 percent of published academic articles. What is special about these countries? Table 2 shows the distribution of published academic articles in five subject categories across the five main countries.

The Russian Federation occupies the following rankings in terms of published academic articles in the Scopus database:

- 21st place in agricultural and biological sciences (1.46 percent)
- 10th place in chemistry (3.50 percent)
- 15th place in engineering (1.93 percent)
- 11th place in mathematics (3.27 percent)
- 19th place in social sciences (1.10 percent)

Table 2. Distribution of Academic Articles in the Main Subject Areas across the Five Main Countries in the Scopus Database between 2011 and 2017, Expressed as a Percentage

Subject category	First-place country	Second-place country	Third-place country	Fourth-place country	Fifth-place Country
Agricultural and biological sciences	U.S. 22.16	China 13.71	Great Britain 6.34	Brazil 6.00	Germany 5.98
Chemistry	China 25.13	U.S. 16.31	India 6.89	Germany 6.76	Japan 6.15
Engineering	China 29.95	U.S. 16.45	Japan 5.22	India 4.72	Germany 4.61
Mathematics	China 20.80	U.S. 19.30	Germany 7.07	France 6.21	Great Britain 5.81
Social sciences	U.S. 29.20	Great Britain 11.00	Australia 4.86	Canada 4.37	China 4.35

Source: Elsevier's Scopus electronic database.

Thus, we can see that the Scopus database is largely focused on English-speaking countries, including the United States, United Kingdom, Canada, and Australia. Academic articles that are published by scholars from China and India have achieved top positions in terms of their number of citations. This can be largely attributed to the large number of researchers in these countries and to the state policy that mandates the use of English as the main language of communication.

Consequently, the institution of indexing articles in the WoS and Scopus databases discriminates against non-English speaking countries. Moreover, these two databases are not in fact the leading indexing databases of academic journals in the world.

The Scopus and Web of Science databases are very expensive information products. Therefore, in developing countries, scientists increasingly utilize open access resources, including Google Scholar, which is the most well-known of these.⁶ Google Scholar also indexes academic articles and citations. However, here we are dealing with another problem: the lack of content filtering means that the quality of the sources cannot be assessed, and that the data obtained from these sources cannot be relied upon in making any evaluations.

Table 3 shows the comparative characteristics of some of the world's indexing databases. We can see that the Scopus and Web of Science databases, which are currently used as a basis to compile reports about Russian

Table 3. Comparative Characteristics about World Academic Indexing Databases

Database	Owner	Country	Number of journals indexed
Directory of Open Access Journals (DOAJ)	Infrastructure Services for Open Access C.I.C.	Great Britain	9,000 ¹
Scopus	Elsevier B.V.	The Netherlands	21,500 ²
Web of Science	Clarivate Analytics	U.S.	12,500 ³
Summon	ProQuest LLC	U.S.	100,000 ⁴
Ulrich's Periodical Directory	ProQuest LLC	U.S.	383,000 ⁵
Index Copernicus	Index Copernicus International	Poland	45,889 ⁶
EconLit	American Economic Association	U.S.	1,000 ⁷
zb MATH	FIZ Karlsruhe GmbH	Germany	3,000 ⁸
PubMed	National Center for Biotechnology Information	U.S.	26 million references ⁹

¹Directory of Open Access Journals (DOAJ), <https://doaj.org>.

²Official website of Elsevier, <https://www.elsevier.com/solutions/scopus>.

³Official website of Clarivate Analytics, http://clarivate.com/product/web-of-science/?utm_source=false&utm_medium=false&utm_campaign=false.

⁴Official website of ProQuest, <http://www.proquest.com/products-services/The-Summon-Service.html#accordionOne>.

⁵Official website of ProQuest, <http://www.proquest.com/products-services/The-Summon-Service.html#accordionOne>.

⁶Index Copernicus International, <http://jml.indexcopernicus.com>.

⁷EconLit, <https://www.aeaweb.org/econlit/>.

⁸zbMATH, <https://zbmath.org>.

⁹PubMed, <https://www.ncbi.nlm.nih.gov/pubmed/>.

academic output, do not represent the most extensive systems for indexing academic articles. Larger amounts of information are presented, for example, in Ulrich's Periodical Directory and the Index Copernicus databases. Moreover, a number of academic fields use specialized citation databases, including journals in mathematics (zbMATH), medicine (PubMed), and economics (EconLit).

Thus, the basing of the academic reporting function on just two global databases harms many researchers, both in how they under-represent the scope of their research and present the results of the research in specialized databases.

Another alternative is the establishment of a national metric of scientific citation. The Russian Index of Academic Citation [in Russian, *Rossiyskiy Indeks Nauchnogo Tsitirovaniya*, RINTs] (RIAC), which was established in 2005, is a national information-analytical system that has indexed more than six million articles by Russian authors as well as citation information about these articles in more than 5,000 Russian journals.⁷

This system was originally conceived of as a tool to assess the effectiveness and efficiency of the activities of research organizations, scientists, the level of scientific journals, etc. Nevertheless, RIAC presents the same problems as Google Scholar does, namely, it does not impose any barriers on the indexing of low-quality content. As a result, it was decided to define the "core" content of RIAC, for which a number of indicators have now been separately calculated.

In addition, 2015 saw the creation of the Russian Science Citation Index (RSCI), a joint project of the eLIBRARY scientific electronic library and the publishing company Thomson Reuters. RSCI is available both via the national eLIBRARY platform and the Web of Science. However, because the role of the project has not yet been legally defined, it is still unclear whether this index is taken into account when assessing the impact of Russian scientific research and making associated decisions about resource allocation.

Therefore, the institution of indexing of articles in the WoS and Scopus databases presents the following drawbacks:

- Articles written by non-English-language authors are discriminated against in indexes (only a small number of foreign-language academic journals are indexed).
- The results of scientific research are assessed in a biased way (the reviewing institution is biased).
- Topics that are of interest to several countries are covered.
- These databases present favorable opportunities for articles from shady publications to be indexed.

- The academic publishing industry becomes ideologized, and it can refuse to quote sources that undermine the ideology of the dominant countries.

We see several possible approaches to reducing the negative effects of the institution of scientific imperialism.

Scientific identity versus scientific imperialism

The negative effects of the institutions of scientific imperialism are summarized in Table 4.

As we can see from the table, the main negative consequences are associated with loss of academic identity on the part of non-English speaking academic authors. The desire to conduct research in such a way as to fully comply with procedures and requirements stipulated by the relatively small world of English-speaking countries discourages scholars from following their national research traditions. Thus, a conflict arises between national identity and the development of institutions of scientific imperialism.

It is only through the development of institutions of national scientific identity that this conflict can be comprehensively resolved. We are able to identify the following possible approaches to the development of institutions of national scientific identity.

Firstly, the publication of research results in the national language should be prioritized. This will help members of the Russian academic community to keep abreast of major developments in science and research. It is important that Russian readers are able to learn firsthand of Russia's advances in

Table 4 Negative Consequences of Establishing Institutions of Scientific Imperialism

Institutions of scientific imperialism	Negative consequences
Institution of publishing academic articles in English	<ul style="list-style-type: none"> – Readers exhibit a greater preference for authors with an “English-sounding” last name. – Readers express greater interest in topics that are relevant to Anglophone societies. – Authors exhibit a greater tendency to quote English-language sources since they perceive that this increases the likelihood that they will be able to publish their manuscripts.
Institution of standardizing how research should be reported.	<ul style="list-style-type: none"> – Authors avoid pursuing creative solutions to complex scientific problems. – Authors unduly focus on a description of research procedures to the detriment of the articulation of the research problem and a discussion of cause-and-effect relationships. – Articles are stripped of their cultural identity.
Institution of indexing of articles in two global databases	<ul style="list-style-type: none"> – Articles from non-English-language journals are indexed in a discriminatory fashion. – Authors have limited latitude to cite articles from journals in a number of academic fields.

research and development under the current conditions of economic sanctions and the policy of import substitution. Ensuring that major research outputs from the national sector of dual-use science and technology are available in the Russian language is an even greater priority.

Secondly, support should be provided for the publication of Russian research results in English-language journals after such deliverables have been published in Russian journals. Evidently, the timeframe for the publication of results in English-language journals following their publication in Russian journals should be similar to the amount of time that is delegated to finding solutions to internal problems related to national import substitution and defense. But this time period should not be prolonged, or otherwise the pioneering nature of the obtained results will be lost at the global level.

Third, the development of Russian academic journals should be prioritized. This will make it possible to escape from the rigid institutions of standardization of academic writing and help promote national manifestations of scientific identity. According to research by the Danish School of Business Studies, Russians are characterized by their boldness and adventurism in solving complex problems [25]. According to the authors, these features set Russian researchers apart from their foreign colleagues. In this regard, Russian academic journals carry on the mission of establishing a national research identity.

Fourthly, the national system for indexing of academic articles should be comprehensively developed. If the Russian Science Citation Index (RSCI eLibrary) were further developed, it would reduce the problem of discrimination against Russian authors on the grounds of their English language proficiency (or lack thereof). In addition, the full-blown development of the RSCI will provide administrators at educational institutions with the necessary citation information for the certification of their research staff and the allocation of scientific resources.

Fifthly, a wider array of global databases should be taken into account. If it were possible for articles to be indexed in more than just two global databases (WoS and Scopus) and to transition to an indexing approach that takes into account a wide variety of global databases, we would be able to reduce the information search fees that are paid to monopolists and to provide more complete coverage of Russian achievements in world academic literature.

The above measures will allow us to get past the scientific monopoly in the world and fully develop the research potential of Russia.

Notes

1. See <https://www.researchtrends.com>.
2. Holcomb, Alex. Open-access science blog, <https://alexholcombe.wordpress.com/2015/05/21/scholarly-publisher-profit-update/>.

3. Current Contents Connect, the official website of Thomson Reuters, <http://thomsonreuters.com/en/products-services/scholarly-scientific-research/scholarly-search-and-discovery/current-contents-connect.html>.
4. Web of Science, the official website of Thomson Reuters, <http://thomsonreuters.com/en/products-services/scholarly-scientific-research/scholarly-search-and-discovery/web-of-science.html>.
5. Scopus, <https://www.scopus.com/home.url>.
6. Google Scholar, <https://scholar.google.ru>.
7. Elibrary.ru website, http://elibrary.ru/elibrary_about.asp.

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