Benchmarking scientific output in the social sciences and humanities: The limits of existing databases[1]

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Abstract

The goal of this paper is to examine the impact of linguistic coverage of databases used by bibliometricians on the capacity to effectively benchmark the work of researchers in social sciences and humanities. We examine the strong link between bibliometrics and the Thomson Scientific's database and review the differences in the production and diffusion of knowledge in the social sciences and humanities (SSH) and the natural sciences and engineering (NSE). This leads to a re-examination of the debate on the coverage of these databases, more specifically in the SSH. The methods section explains how we have compared the coverage of Thomson Scientific databases in the NSE and SSH to the Ulrich extensive database of journals. Our results show that there is a 20% to 25% over-representation of English-language journals in Thomson Scientific's databases compared to the list of journals presented in Ulrich. This paper concludes that because of this bias, Thomson Scientific databases cannot be used in isolation to benchmark the output of countries in the SSH.

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Introduction

Scientometric methods are increasingly used for science policy purposes, more particularly in Europe. The use of scientometrics for policy purposes has so far been mostly limited to the natural sciences and engineering (NSE), but this is changing and the extension of this evaluation process to the social sciences and humanities (SSH) may be a cause for concern. A number of scholars have highlighted fundamental differences between the scientific communication practices of scholars in the NSE and those in the SSH (Glänzel and Schoepflin, 1999; Hicks, 1999 and 2004; van Raan, 2003; Larivière et al., 2006). For instance, SSH comprise a greater proportion of scientific publications which are not journal articles, especially books, and the research orientation is more local.

Most bibliometric studies are based on one or more of the Thomson Scientific databases: the Science Citation Index (SCI), the Social Sciences Citation Index (SSCI), and the Arts and Humanities Citation Index (AHCI). It has often been argued that the SSCI and the AHCI do not cover adequately journals and articles in languages other than English. As the examples provided further below show, there has been a healthy debate going on for years on this issue, with various researchers commenting on the possible bias induced by Thomson Scientific's coverage (Glänzel 1996; Hicks 1999, 2004; Nederhof and Noyons 1992; Schoepflin 1992; Webster 1998).

The goal of this paper is to shed light on this debate and to examine the impact of linguistic coverage of the databases on the capacity to effectively benchmark the work of researchers in social sciences and humanities in various countries. We examine the strong link between bibliometrics and the Thomson Scientific database and review the differences in the production and diffusion of knowledge in the SSH and NSE. This leads to a re-examination of the debate on the coverage of these databases, more specifically in the SSH. The methods section explains how we have compared the coverage of Thomson Scientific databases in the NSE and SSH to the Ulrich extensive database of journals. Our results show that, for SSH, there is a 20% to 25% over-representation of English-language journals in Thomson's databases compared to the list of journals presented in Ulrich. This paper concludes that because of this bias, Thomson Scientific databases cannot be used in isolation to benchmark the output of countries in the SSH.

The marriage of bibliometrics and Thomson Scientific's databases

Bibliometrics and scientometrics are a set of methods for measuring the production and dissemination of scientific knowledge. Derek de Solla Price and Vasilij Vasilevich Nalimov were the originators of the discipline, which they developed for the purpose of providing research tools to historians and sociologists of science. However, it was only with the advent of the tools developed by the Institute for Scientific Information (now Thomson Scientific) and the research conducted by its founder, Eugene Garfield, that the use of bibliometrics became widespread. With their systematic archiving of articles from a selection of some of the most prestigious and most frequently cited scholarly journals, the Thomson Scientific databases considerably reduce the effort required to carry out bibliometric analyses. This partly explains why there has been a convergence of interest between Thomson Scientific and the bibliometric community and why the most commonly used databases in bibliometric analyses are by far the ones produced by Thomson Scientific. Like most lasting marriages, there has been a healthy dialogue between the partners and both the tools and the users have grown in sophistication through mutually beneficial exchanges. Because we are strong advocates of these tools, we feel that we ought to address their shortcomings in the hope they'll get even better over time.

It must also be stated that the Thomson Scientific production process, although not always as transparent as bibliometricians would like it to be, is fairly well documented. Established scholars select the journals to be covered in cooperation with users, publishers and members of editorial boards. Selection criteria include publication frequency, compliance with international presentation conventions, and a peer review committee. Thomson Scientific's databases are particularly useful for a number of reasons (see Katz and Hicks, 1998, among others):

- Their primary advantage is coverage. They cover all research fields, giving ready access to aggregated data. Unlike a number of other databases, which may cover some journals only in part (depending on the relevance of an article to single-discipline database, for example), these databases systematically index all articles and other items in the selected journals. Nearly 10,000 existing learned journals are covered.
- The criterion for including a journal in SCI and SSCI is the number of citations it receives. Because citations are perceived to be an indicator of interest and recognition on the part of scholars, the citation count is considered as evidence of the usefulness, quality and/or impact of a journal. According to Eugene Garfield, 90%–95% of the most frequently cited articles in the natural sciences are published in a core group of about 2,000 journals (CNER, 2002, citing Garfield, 1996). However, it is noteworthy that AHCI inclusion criteria are more subjective. According to Thomson Scientific:

> Publishing standards, including timeliness, are also important in the evaluation of Arts and Humanities journals. Citations in the Arts and Humanities, however, do not necessarily follow this same predictable pattern as citations to Social Sciences and Natural Sciences articles. Citations to an article on the 19th Century Romantic novel, for example, may accrue slowly at first, and then slacken, fluctuating over time in cycles consistent with scholars' varying interest in the topic. In addition, Arts and Humanities journal articles reference non-journal sources heavily (e.g., books, musical compositions, works of art and literature). Consequently, citation data, while sometimes useful, are frequently much less so in journal evaluations in the Arts and Humanities. Arts & Humanities journals are selected by the primary editor with the support of the subject experts from the ISI Arts & Humanities indexing staff. The goal is the collection of superb Arts and Humanities content that reflects the complex nature of cultural phenomena across a broad range of fields.
> http://www.isinet.com/essays/selectionofmaterialforcoverage/199701.html/

- Thomson Scientific databases contain the institutional addresses for all authors of a given article. Other databases such as Medline usually contain only the address of the first author. Without a complete address list, the analysis of research collaboration is impossible.
- Only Thomson Scientific databases contain the complete list of references (citations), which makes it possible to measure research impact. In the opinion of Katz and Hicks, this attribute alone justifies using these databases as science policy and research management tools.

Thomson Scientific databases, like all databases used for scientometric evaluation, also have limits. These will affect the validity of bibliometric evaluation in both the NSE and the SSH. The main problems with research publication databases comprise (CNER, 2002):

- limited coverage;
- exclusion of certain types of documents;

- classification of journals by discipline;
- changes in journal titles;
- different individual authors with identical names (homographs);
- unequal distribution of work among authors which might not be reflected;
- negative and erroneous citations, self-citation and citations among groups.

Another disadvantage is that they are relatively costly to use (Katz and Hicks, 1998). Since bibliometrics is generally based on the use of bibliographic databases, all the above factors reduce the validity of bibliometric research evaluation. These problems are common to most databases and reflect the limitations of compiling and indexing academic journals and articles. But scientometric analyses can also be affected negatively by practices specific to the fields concerned. As we will see in the following section, this is the case in the SSH.

SSH are not NSE

According to Line (1999), most social sciences can be described as "relatively young, and scarcely organized as coherent disciplines." He argues that the SSH are fragmented because they do not have international standards for rigorously defining concepts. Terms used vary markedly between regions and over time. Another factor leading to fragmentation is a greater reliance on various means of delivering research results. Hicks (1999) expands on this view by saying that a number of SSH disciplines have more paradigms competing with one another than do those in the NSE, and as a result the SSH literature is more fragmented—a situation that hinders the formation of a solid "core" of scientific journals (Hicks 1999), thereby making article-based bibliometric analysis more difficult to conduct successfully.

The SSH also differ in their scientific communication practices (Glänzel and Schoepflin, 1999; Hicks, 1999 and 2004; Moed, Nederhof and Luwel, 2002; van Raan, 2003). Knowledge dissemination media and, by extension, communication media in general are more varied in the SSH than in the NSE. In contrast to the NSE where journals are the dominant form of knowledge dissemination, a recent bibliometric analysis of referencing practices have shown that references to journal articles can be as low as 25% in the humanities (Larivière et al. 2006).

Another problem facing the scientometric analysis of the SSH is what authors have called their local orientation. Whereas the problems identified in the NSE tend to be universal in nature, SSH research subjects are sometimes more local in orientation and, as a result, the target readership is more often limited to a country or region (Glänzel, 1996; Hicks, 1999; Hicks, 2004; Ingwersen, 1997; Nederhof et al., 1989; Nederhof and Zwaan, 1991; Webster, 1998; Winclawska, 1996). Indeed, the literature suggests that the readership in the natural sciences is the international scientific community. Research in physics or biology can be carried out and reused by interested experts anywhere in the world, with the same results; for instance, the properties of an electron are the same everywhere on Earth. In the natural sciences, the outcome of this universality is that dissemination is international.

By contrast, SSH research deals with local and regional problems more often than is the case in the NSE. It follows that SSH research subjects are more specific to a particular culture than are the problems in the NSE. Hicks (1999 and 2004) suggests that theoretical concepts in the social sciences are more subtle (or idiographic) and cannot be expressed in the universal language of mathematics as much as theoretical concepts can be in the natural sciences. In many cases, the concepts and subjects covered in the SSH can be expressed and understood only in the culture that is shaping them and, consequently, SSH scholars reportedly publish

more often in their mother tongue and in journals with a more limited distribution (Gingras, 1984; Line, 1999). Accordingly, SSH scholars publish somewhat more in their own language and in journals with national distribution, than do NSE researchers.

Table 1 presents data on Finnish research output. It includes data on the number of publications written in Finnish, irrespective of type of publication (article, book, conference proceedings), as well as data on Finnish articles in peer-reviewed journals with an international distribution (this data necessarily covers only research articles). These data support the thesis that the SSH are more locally oriented, since the number of publications written in Finnish is much greater than those published in international journals. It also supports the thesis that the SSH is becoming increasingly internationalized, because the number of articles published in internationally distributed journals has grown significantly since 1994.

Table 1. Annual output of Finnish scholars

Field	Type of publication	1994	1998	2002
Natural Sciences and Engineering	Local orientation, written in Finnish	3,787	3,032	2,828
	International journal with peer review	6,419	6,702	7,857
	Ratio	0.6	0.5	0.4
Social Sciences and Humanities	Local orientation, written in Finnish	2,871	4,001	3,570
	International journal with peer review	685	984	1,265
	Ratio	4.2	4.1	2.8

Source: Academy of Finland 2003

Revisiting the debate on Thomson Scientific coverage

If the assumptions mentioned above on the local orientation of SSH research are correct, it is important to determine whether the tools used by bibliometricians to perform international benchmarks reflect adequately this state-of-affairs. In particular, since they are the tools used de facto by the bibliometric community, it is important to determine if Thomson Scientific databases provide an un-biased coverage of literature that is more national in scope and with a more local distribution. Since English is used only by a small proportion of SSH researchers in non-English countries and that SSH publications are more often written for a local audience, it is important to determine if these databases adequately reflect production in languages other than English. A number of studies provide some empirical data on a potential distortion in the representation of the SSH offered by the SSCI and AHCI.

A comparison of the UNESCO list of social sciences periodicals with that of Thomson Scientific revealed significant differences (Schoepflin, 1992). The UNESCO list contains about 2.5 times more academic journals than the SSCI list. U.S. journals account for about 60% of SSCI coverage, yet they represent only 17% of all journals according to the UNESCO list. The comparison also shows that SSCI includes 852 U.S. journals in their coverage, while the UNESCO only lists 611 such journals.

Nederhof and Zwaan (1991) noted that the coverage provided by the two databases varied considerably by field, journal importance and language. Only 3% of Dutch articles in public administration were covered by the SSCI, compared with 58% of articles in experimental psychology. With respect to the humanities, coverage varied from 10% of articles in Dutch language studies to 39% of articles in general literature. According to Kyvik (1988, cited by

Nederhof and Zwaan, 1991), only one third of Norwegian publications in the SSH during the period 1979–81 were written in a language other than Norwegian, compared with 74% of the publications in the natural sciences.

Authors have made a strong case to the effect that France, Spain and Germany are under-represented in SSCI (Ingwersen, 2000). Even though all three countries enjoy a strong SSH tradition, this fact is not reflected in SSCI. For example, a study covering the periods 1989–93 and 1994–98 reports that Germany is last out of 17 countries ranked according to research impact in the social sciences (Ingwersen, 2000). More specifically, Schoepflin (1992) gives the results of surveys of German scholars, who were asked to identify the academic journals with the highest profile and the greatest value for their respective disciplines. Based on their responses, SSCI covers 94% of German journals in developmental psychology but only 26% in sociology and 8% in education. Mela, Cimmino and Ugolini (1999) argue that:

> bibliometric analyses are biased towards English language journals, and authors of some nations (e.g. France and Germany) with a strong tradition of publishing in their native languages and less prone to submitting papers to internationally peer-reviewed English language journals may be penalized in comparative studies drawing on databases that include few non-English-language publications.

Andersen (2000, citing Andersen, 1996) suggests that the authors of 60% of the articles indexed in SSCI have U.S. addresses and the authors of 20% of them have U.K. addresses. Since Thomson Scientific selects journals according to the number of citations they receive, the citation habits of the various language communities play an important role in the actual compilation of the Thomson Scientific databases. For example, U.S. and U.K. sociologists cite articles written in English in 99% of cases. At the same time, those articles account for approximately 70% of international literature in sociology (Yitzhaki, 1998). This factor in itself might explain in part the suspected Anglo-Saxon over-representation in the Thomson Scientific databases.

In light of statistics like these, a number of bibliometricians claim that the SSCI and AHCI databases have a bias in favour of English-language journals from English speaking countries—specifically, the U.S., the U.K. and, to a lesser extent, Canada and Australia (Andersen, 2000; Glänzel, 1996; Nederhof and Noyons, 1992; Schoepflin, 1992; Webster, 1998). This seems to be confirmed by Godin (2002) who, using the SSCI, placed the United States and the United Kingdom as the most productive countries in the social sciences for the year 2000, followed by Canada and Australia, and then by Germany, the Netherlands and France. Presented without any critical distance, these results are, in fact, hard to believe as it seems very improbable that Canada and Australia would produce more papers in the SSH than a country like Germany with its much larger population and its long traditions of prolific authors. Because of a lack of robust evidence to back up this claim, we decided to verify whether Thomson Scientific databases were sufficiently representative of various countries and languages in which knowledge is produced.

Methods

To assess the coverage of national literatures by Thomson Scientific, we compared the list of journals covered in Thomson Scientific's citation indexes with an exhaustive and comprehensive source of scientific journals from all over the world—the Ulrich directory. While this method has been used by Braun, Glänzel and Schubert (2000) to assess the field by field coverage of the SCI, no equivalent analysis has been done on the coverage of the SSCI and the AHCI databases.

The lists of journals in the Thomson Scientific databases—the Science Citation Index (SCI), the Science Citation Index Expanded (SCI_E), the Social Sciences Citation Index (SSCI) and the Arts and Humanities Citation Index (AHCI)—were taken from the Thomson Scientific website (http://www.isinet.com/journals/) as of June 3, 2004. Journals data were subsequently extracted from the 2004 second edition of the CD-ROM of Ulrich's International Periodicals Directory (ISSN 0000-0507). Journals in these two sources were matched by means of their ISSN number. Over 95% of the Thomson Scientific journals were matched with the Ulrich database. Since 93.5% of the matched Thomson Scientific journals are peer reviewed (SCI = 98.6%; SSCI = 97.4%; AHCI = 73.4%), the analysis in this paper is based only on peer-reviewed journals from both Thomson Scientific's databases and the Ulrich directory.

The language of journal editors and the language of journals are directly coded in Ulrich. More than one language is provided for some journals. In such cases, equal fractions have been assigned to each of the main languages of the journal concerned. Thus for a journal that mainly contains texts in English and French and only occasionally includes Spanish texts, 0.5 goes into the "English" column and 0.5 into the "French" column. Although this technique is not perfect, the effect of this distribution is negligible due to the large numbers involved in this analysis. For the analysis of the languages of editors' countries, the first language attributed to countries in the World Factbook[2] was used.

Findings

Table 2 presents statistics on the proportion of journals by country of editor (not publishing company). It gives, in sequence, data on NSE and SSH journals covered in Thomson Scientific's databases and in Ulrich's journal database. The Table shows that journals with U.K. editors are very heavily over-represented in the Thomson Scientific databases, especially in the SSH. According to Ulrich, 18% of journals have a U.K. editor, whereas Thomson Scientific indexes 27% of journals with an editor in that country—an over-representation factor of 55%. SSH journals with editors located in the Russian Federation, the U.S., Switzerland and the Netherlands are over-represented too, while virtually all other countries are under-represented.

[2] http://www.cia.gov/cia/publications/factbook/index.html

Table 2. Journal coverage rates by country of editor

Country	NSE			SSH		
	Thomson ISI	Ulrich	Difference	Thomson ISI	Ulrich	Difference
United Kingdom	23.1%	17.0%	36%	27.1%	17.5%	55%
Russian Federation	1.61%	1.43%	12%	0.34%	0.25%	36%
United States	36.4%	30.6%	19%	50.4%	37.3%	35%
Switzerland	2.66%	2.11%	26%	0.56%	0.51%	8%
Netherlands	9.44%	8.28%	14%	7.69%	7.35%	5%
Canada	1.31%	1.29%	1%	2.52%	3.21%	-21%
France	2.42%	2.57%	-6%	1.03%	1.35%	-24%
Germany	7.72%	6.16%	25%	3.93%	5.94%	-34%
Japan	2.26%	3.71%	-39%	0.47%	1.04%	-55%
Australia	1.19%	2.05%	-42%	1.07%	3.64%	-71%
Spain	0.38%	1.33%	-72%	0.26%	1.03%	-75%
Belgium	0.18%	0.37%	-52%	0.51%	2.06%	-75%
India	0.87%	2.24%	-61%	0.21%	1.57%	-86%
Poland	0.67%	1.62%	-58%	0.17%	1.34%	-87%
Italy	1.05%	1.70%	-38%	0.13%	1.21%	-89%
China	0.91%	2.91%	-69%	0.09%	0.94%	-91%
Brazil	0.30%	1.06%	-72%	0.04%	0.96%	-96%
Other	7.54%	13.59%	-45%	3.50%	12.79%	-73%

Source: Compiled from Thomson Scientific's and Ulrich's data.

Table 3 gives the distribution of Thomson Scientific coverage and Ulrich's listing by principal language of country of journal editor. It shows that only journals with editors in countries where the language spoken is English or Russian are over-represented. For example, SSH journals with editors in French-speaking countries are under-represented by 27% in the Thomson Scientific databases.

Table 3. Journal coverage rates by language spoken in editor's country

Language	NSE			SSH		
	Thomson ISI	Ulrich	Difference	Thomson ISI	Ulrich	Difference
Russian	1.61%	1.43%	12%	0.34%	0.25%	36%
English	64.1%	54.7%	17%	81.8%	64.8%	26%
Dutch	9.62%	8.65%	11%	8.20%	9.41%	-13%
Czech	0.32%	0.70%	-55%	0.30%	0.35%	-15%
French	2.42%	2.58%	-6%	1.03%	1.40%	-27%
German	10.79%	9.03%	19%	4.61%	6.99%	-34%
Japanese	2.26%	3.71%	-39%	0.47%	1.04%	-55%
Danish	1.23%	0.88%	40%	0.26%	0.66%	-61%
Afrikaans	0.26%	0.61%	-57%	0.38%	1.14%	-66%
Swedish	0.32%	0.35%	-10%	0.21%	0.66%	-67%
Chinese	1.71%	3.87%	-56%	0.43%	1.74%	-76%
Spanish	0.97%	3.18%	-69%	0.56%	3.01%	-82%
Polish	0.67%	1.62%	-58%	0.17%	1.34%	-87%
Italian	1.05%	1.70%	-38%	0.13%	1.21%	-89%
Portuguese	0.30%	1.14%	-74%	0.09%	1.08%	-92%
Arabic	0.06%	0.58%	-90%	0%	0.52%	-100%
Other	2.28%	5.31%	-57%	1.07%	4.39%	-76%

Source: Compiled from Thomson Scientific's and Ulrich's data.

To determine the role of language factors in journal coverage rates in the Thomson Scientific databases, we also considered the actual language of journals. Table 4 shows a clear selection bias in favour of journals in which the articles are written in English. Whereas 75% of peer-reviewed journals indexed in Ulrich are in English, almost 90% of those selected by Thomson Scientific are in English, yielding an over-selection rate of about 20%. The only other over-represented language in the Thomson Scientific databases is Czech, a language that plays a marginal role in the global science system. French is under-represented by 26%, German by 50% and Spanish by almost 70%.

Table 4. Journal coverage rates by language of article

Language	NSE			SSH		
	Thomson ISI	Ulrich	Difference	Thomson ISI	Ulrich	Difference
English	88.5%	78.1%	13%	89.7%	74.9%	20%
Czech	0.04%	0.27%	-85%	0.19%	0.18%	8%
Russian	0.49%	0.94%	-48%	0.31%	0.41%	-24%
French	3.26%	3.36%	-3%	3.21%	4.36%	-26%
Multiple languages	0.21%	0.24%	-14%	0.28%	0.50%	-45%
Dutch	2.23%	2.23%	0%	1.34%	2.58%	-48%
German	3.20%	3.89%	-18%	2.95%	5.85%	-50%
Japanese	0.43%	1.66%	-74%	0.21%	0.60%	-64%
Swedish	-	0.09%	-100%	0.12%	0.40%	-69%
Spanish	0.64%	2.58%	-75%	0.91%	2.99%	-69%
Italian	0.14%	0.84%	-83%	0.21%	1.08%	-80%
Danish	0.04%	0.08%	-50%	0.06%	0.34%	-83%
Portuguese	0.11%	0.73%	-85%	0.14%	0.96%	-86%
Chinese	0.30%	2.39%	-88%	0.04%	1.16%	-96%
Polish	0.05%	0.65%	-92%	-	0.86%	-100%
Arabic	-	0.12%	-100%	-	0.34%	-100%
Turkish	0.01%	0.22%	-95%	-	0.10%	-100%
Other	0.32%	1.58%	-80%	0.33%	2.43%	-87%

Source: Compiled from Thomson Scientific's and Ulrich's data.

Discussion and conclusion

Bibliometric analyses reflect the biases of the databases used and because of the marriage between bibliometrics and Thomson Scientific's databases, bibliometric analysis can be said to by-and-large reflect the limits of Thomson Scientific's databases. Admittedly, Thomson Scientific is a commercial enterprise which sells theses databases as bibliographic tools, but since these tools are in fact the ones that are the most widely used to benchmark scientific output, it is essential to precisely characterize them. The findings presented in this paper show that for the combined SSCI and AHCI coverage, there is a 20-25% bias in favour of English-language scientific output in the SSH, and that French, German and Spanish journals are respectively underestimated by 28, 50 and 69%.

Thus, these data clearly show that Thomson Scientific's SSH journal selection favours English. This may be due to differences in the quality of research output according to the language of articles. According to Hodgson and Rothman (1999), 388, or 84%, of the 463 editors of the 30 most prestigious economics journals are affiliated with U.S. institutions. This might be a sign that English is dominant in Thomson Scientific's simply because it is the favoured language for high quality research. Thus, the over-representation of English in the databases would after all be a fair or justifiable reflection of scientific dynamics. This view is at least partly corroborated by results from Zitt (2003) who shows that the exclusion of national oriented journals has a positive effect on the calculation of their "national impact factor". In the opinion of Moed, Nederhof and Luwel (2002), truly academic research should be relevant internationally and local orientation should not be a factor in bibliometric evaluations. From this perspective, research not covered by the Thomson Scientific databases simply fails to reach the relevance threshold that would warrant closer evaluation. But defining the quality of academic research as what is interesting from an international

perspective is far from obvious, as it implicitly accept the norm of the physical sciences and thus raises important normative questions.

Moreover, it is questionable whether research articles written in languages other than English are of lower quality in such a high proportion as the bias observed in our data. In fact, it may be difficult to rely solely on Thomson Scientific to be the impartial judge of what is and is not quality research output, without going into a circular argument. This position is even more doubtful considering Thomson Scientific self admitted inability to analyse the content of journals in languages other than English — a fact that is clearly stated on Thomson Scientific's website:

> English language article titles, abstracts, and keywords are essential [for inclusion in Thomson Scientific's databases]. English language cited references are also recommended. Although important scientific information is published in all languages, authors must provide English translations of article titles, author keywords, and abstracts if they hope to reach the widest possible audience. Likewise, as a purely practical matter, it would not be feasible for ISI [Thomson Scientific] to take on the task of translating this material.[3]

Because its selection criteria require journal bibliographic information to be in English, Thomson Scientific may fail to index the content of an excellent journal in philosophy, for example, because its content is only presented in German.

The original contribution of this paper is to shed light on how the bias of bibliographic databases has a particularly important effect in the benchmarking of national output in SSH research due to the greater importance of local journals and languages. Having shown that the staple databases used in bibliometric analyses do not reflect well the geographic and linguistic distribution of scientific production, it appears essential to reiterate the warnings already made elsewhere on the danger of relying on these tools to produce rankings of countries in terms of SSH output. It is essential to factor the bias into any international comparative analysis of the SSH since any benchmarking based on SSCI and AHCI will overestimate the production of English speaking countries such as the U.S., the U.K. and Canada and underestimate that of Germany, Spain, France and other non-English-speaking countries, and this bias will affect both publication counts and citation analyses. And given the increasing uses of performance indicators based on bibliometrics in social sciences and humanities, it is essential to take all due precautions to prevent perverse effects.

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