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2006

The Dangers of Partial Bibliometric Evaluation in the Social Sciences

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Available at: https://works.bepress.com/diana_hicks/9/

D. Hicks, (2006) The Dangers of Partial Bibliometric Evaluation in the Social Sciences, *Economia Politica*, XXIII, n. 2 August, pp. 145-162

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April 22, 2006

Social science research communities around the world face pressures for quantitative evaluation imposed from outside. Traditional methods of allocating jobs and research funding may not be seen as sufficiently merit-based to ensure research excellence and international competitiveness. In this environment, the preferred evaluation methodology tends to be SSCI-based bibliometrics, more or less exclusively. In this paper, I reflect on the merits of this approach by examining the nature of the social science literature as it relates to bibliometric evaluation. The argument is based on a thorough review of the literature of social science bibliometric methodology.

Bibliometric evaluation in the social sciences is possible. However, if done correctly, it is messy, complex and expensive. This hard truth can be and often is evaded. Many published evaluations restrict themselves to the methods and data sources used to evaluate natural sciences. That is, analyses are compiled from the *Social Science Citation Index* and only the SSCI. This literature and its proponents can be referenced in support of SSCI-exclusive assessment of social science research. However, this paper argues that while SSCI analyses are necessary they are not in themselves sufficient to assess properly social scientists' scholarly work. SSCI-only analyses are easier and cheaper, but they misrepresent the true state of the social science community being examined.

Why is bibliometric evaluation in the social sciences complex, messy and expensive? When I say this, I am comparing against bibliometric evaluation in scientific research. In the natural sciences, Science Citation Index (SCI) based bibliometrics has proved itself a powerful evaluation tool often used routinely. Why? There are three main reasons. 1) Scientists are in the habit of publishing their research mostly in English and mostly in journal articles. This is the material covered most thoroughly by the SCI. 2) Scientists are oriented to the research frontier and heavily reference recent papers in comparison with sociologists or economists who heavily reference older, foundational papers (Hargens). Therefore, scientific papers accumulate citations over a few years at most. 3) Scientists work within disciplinary frameworks and normally reach consensus. So their citations are focused as well as current and are accessible if a bounded set of journals is indexed. And it is possible to index a set of key journals because scientists recognize a set of core journals that are high quality and high impact. Publishing English language journal articles in a set of core journals and building quickly on important discoveries, these habits of scientists lend themselves to effective indexing of research output and citations in the SCI and then to sound evaluation based on the SCI.

And there is more. Increasingly we are interested in seeing if research is connected to technology. Patent citations to scientific literature will help us here, and these are almost as well indexed and well behaved as the journal literature (Narin, 1994; Narin et al., 1997). They are also becoming more useful as more and more public sector researchers patent.

When challenged to evaluate scholarly work in the social sciences, we are rudely forced to work outside this comfort zone in a frankly messy set of literature. In the social sciences, we find English language journal publication, which is indexed in the SSCI. But if we look closely, we also see that books are published, and books are not indexed in the SSCI. We see social scientists actively publishing in local languages. We even see contributions to trade literature and the popular press. We see some swift referencing, but we also see archival referencing stretching far back in time. This means that citations accumulate at a geological pace from the perspective of policy makers. And for reasons we will explore, the idea of a core set of journals can be

problematic. This paper examines these difficulties and what I have come to call the four literatures of social science: journal articles, books, national literature, and non-scholarly literature. I will examine the methodological problems the four literatures present in evaluation and will assess the success of efforts to resolve the problems and the consequences of ignoring them.

1. JOURNAL ARTICLES

The first literature of social science is internationally oriented, largely English language, peer reviewed journal articles. The SSCI indexes these, so people can and do apply classic bibliometric techniques to produce SSCI-based social science evaluations. These analysts also acknowledge to varying degrees that they have excluded the three other literatures.

Glanzel (1996) produced tables listing countries' publication and citation counts and shares, and citation per paper indices between 1990 and 1992. Glanzel knew about the problems, and he urged cautious interpretation of his SSCI based indicators. Glanzel had a deep understanding of the time distribution of citations. He believed that a decade long citation window would be needed to capture the slow accumulation of citations in social science. But an evaluation that included only papers with a 10 year record of citation would be obsolete. Glanzel compromised with a shorter citation window but the evaluated social scientists paid the price in that their citation rates appeared low and a lot of their literature was counted as uncited.

Katz compared national levels of social science journal publication. The UK was the focus, and Katz found that the UK share of papers increased between 1981 and 1998. Larger and faster growing fields were identified for the UK and its constituent regions. Katz addressed the methodological issues by limiting his study to psychology and economics, the two social science fields with the most science-like publication patterns.

Ingwersen, in a series of papers, examines at the national level Scandinavian publication and impact in social science and medical areas. He compared Nordic countries in publication output and citation impact by field within social science or health areas. Ingwersen found high impact work in the health sciences and individual country strength in particular social science areas. He made a policy connection between strength in health sciences and strong social welfare states. By 2000, Ingwersen found that Scandinavian output was increasing and often a country's share of SSCI literature was comparable to their share of scientific literature. He argued that increased publication output by small countries in the SSCI makes it increasingly relevant for analysis of non-US countries in some fields.

Aligned with Ingwersen, Godin noted that Canada's share of papers in the social sciences stands at 5.8%, larger than its share of papers in the sciences and engineering — which is slightly over 4%. Godin argued that this was evidence that the SSCI was useful for social science evaluation. Godin's study counted Canadian papers by province, by sector, and by field, and counted collaborations at the sector level. He identified health and psychology as areas of Canadian specialization.

All these SSCI-based evaluations handled the SSCI data well. They produced useful insights into national patterns of publication in SSCI-indexed journals. The authors also acknowledged the methodological issues inherent in SSCI-based bibliometrics. Nevertheless, a problem lurks behind these evaluations: social scientists publish in more than just SSCI-indexed journal articles.

Studies that examine bibliographies make this point quite clear.

- Bourke, Butler, and Biglia examined two bibliographies of Australian university research output. They found that natural scientists published about 85% of the time in journal articles or published conference papers; whilst for social scientists and the humanities the figure was about 61%. Books, edited books, book chapters, monographs and reports, creative works and ‘other’ accounted for the rest.
- Pestaña, et al. constructed a bibliography of the research output of the Spanish Scientific Research Council (CSIC) whose seven natural science divisions published 81% of their output in journals compared to the one humanities/social science division’s 54%.
- Winterhager examined German sociology publishing in the German SOLIS database and found that 42% is published in journals.

I conclude that journal-based bibliometric indicators will be based on a smaller fraction of research output in the social sciences than in the natural sciences.

Luwel et al. took this point very seriously in a project analyzing the research activities of four major Flemish universities in law and linguistics (Luwel et al., 1999; Moed et al, 2002). The study included no citation information nor did it draw evaluative comparisons amongst the universities. Rather the study represented an extended discussion with representatives from the law and linguistics faculties in the four universities with input from publication counts. Based on survey data, the authors analyzed how scholars spent their time, turnover rate amongst scholars, complex self-reported sub-disciplinary structures, external funding, prizes, and publications classified into 30 categories. Surveys also gathered information on peer recognition of scholars and local and international impact of journals. The authors’ extensive cleanup and classification of research output combined with their rating of journals for international impact and quality provided a means of devising output indicators independently of the SSCI.

Social scientists publish outside journals, especially in books, but the problems do not end there. Inter-disciplinarity is rampant in the social sciences, and inter-disciplinary research creates widely scattered citation patterns:

- Leydesdorff reports that 79% of references from scientific papers indexed in the SCI are references to other papers indexed in the SCI, but only 45% of references from social science papers indexed in the SSCI are within the database.
- Small and Crane (1979) conducted a co-citation clustering of psychology, economics, and sociology 1972-1974. They did find sociology clusters, but the citing papers were generally not in sociology journals. Psychology and economics were much better behaved, with psychology papers citing psychology papers and economics papers citing economics papers. They found that economics clusters were more strongly linked to each other by cross citation than were the sociology clusters. Examining links between clusters and other disciplines revealed that sociology clusters have more connections with other fields than do economics clusters. Small and Crane found that sociology’s citing patterns were less focused on literature in the same field than economics. Sociology clusters were less strongly linked to each other and more strongly linked to clusters in other fields. Thus sociology was more trans-disciplinary than economics.

- Similar evidence of trans-disciplinarity emerged from a study by Glanzel et al. (1999). These authors wanted to classify papers based on the journals they referenced. So a paper that referenced papers in sociology journals would be labeled a sociology paper. In particular, if more than half of a paper's references were to sociology journals, the paper was classified as sociology. 25% of the papers in the American Sociological Review (ASR) could not be classified as sociology, whilst 6% of papers in Developmental Psychology could not be assigned to psychology. Sociology again appears more trans-disciplinary than psychology.

Broad, unfocused citing fragments the literature so that in the worst cases no core of literature in a field can be identified (Nederhof et al., 1989). This is more than an interesting observation. There are consequences for bibliometric evaluation. If there is a core literature, the SSCI can identify it and provide comprehensive coverage. If there is no core literature, SSCI coverage of journal literature may be less than ideal. We have seen that fragmentation varies by field, and less trans-disciplinary fields are less fragmented. So it is not surprising to find that SSCI coverage varies by field, with economics and psychology literature the best covered.

Two studies provide detailed field breakdowns of SSCI coverage figures. Nederhof et al.'s (1989) found that SSCI coverage of Dutch output ranged from 62% of journal articles in experimental psychology to 2% in public administration.

Butler found that the SSCI covered more than 40% of Australian articles in the fields of anthropology, archaeology, philosophy, law, and economics. But only 25% of history was covered. In Butler's data there was an inverse correlation (minus 0.83) between share of journal articles indexed in the SSCI and share of total publications accounted for by books or chapters in edited books. That is, the more books in a field, the smaller the share of its Australian journal literature covered by the SSCI.

Butler's result extends the trans-disciplinary argument by linking a lack of core literature and the presence of many books. If trans-disciplinarity varies by field then fields with a higher share of books should have less core journal literature. In Butler's data economics, and anthropology and archaeology exhibited the pattern most similar to science, with the highest share of articles covered and a low share of books while at the other extreme, history exhibited a humanities pattern.

Books are not only found in trans-disciplinary areas, they are themselves trans-disciplinary documents.

- In 1971 Broadus found evidence that books referenced more widely than journal articles. That is, in comparison to a journal article, a book will reference more often work outside its specialty.
- Looking at citations to books, Clemens' et al. studied sociology and reported that books received the majority of their citations from outside the discipline of sociology. The least cited books received 55% of their citations from outside sociology compared with 16% of citations to journal articles. The most cited books received 79% of their citations from outside sociology and the most cited articles 55%.

Books are trans-disciplinary and in this they differ from journal articles. I now turn to a closer examination of books.

2. BOOKS

Social scientists write books. Books are not indexed in the SSCI, so including them in an evaluation is difficult. It has been done though.

For example, Lewison examined books in the history of medicine. The first problem was to build a list of books. He compiled this from book reviews and from references in papers listed in the SSCI, but he did not have the addresses of the book authors. Those were painfully gathered from SSCI papers authored by the same people, but only one-quarter of the books could be assigned to countries in this way. Nevertheless, he counted citations in the SSCI and book reviews (indexed in the SSCI and so easily accessible) finding the UK to be increasingly strong in the history of medicine. But the counts of reviews and citations did not correlate; in fact there was little overlap between books that were reviewed and books that were cited. The historians he interviewed were not surprised; to them reading a book is the best way of evaluating it, followed by reading a review and then by the number of citations. The number of reviews ranked considerably lower.

Books are difficult to find, but they are also a small percentage of social science output, and so perhaps we can ignore them, unfortunately not because in the social sciences books have a high impact.

- Small and Crane (1979) analyzed references from journal articles indexed in the SCI and SSCI and found that the share of the cited items that were books was:
 - 0.9% in high energy physics;
 - 15% in psychology;
 - 25% in economics;
 - 39% in sociology.

So although we ignore books when evaluating science, in social science indicators built from SSCI indexed material — journal articles and citations to them — will miss the 40% of citations received by books.

- Studies have found that within the same area, books are more highly cited than journal articles by ratios ranging from 3 to 1 up to 6 to 1.
- Clemens et al. (1995) compared sociology articles in top journals with sociology books nominated for awards. Citations to the 20 most cited articles ranged up to 55 while citations to the 20 most cited books ranged up to 512.
- Webster's (1998) lists of most cited Polish sociology documents are mostly books - 18 out of 19 cited in the Polish Sociology Citation Index.

So books are high impact. Under the rules of bibliometrics we cannot ignore them.

Perhaps we can argue that the results of journal-only evaluation will correlate with the results of a journal and book based evaluation. Then the less-than-ideal journal based evaluation may be good enough. Unfortunately not, books are not just large, highly-cited journal articles. Evidence is found in the lack of correlation between cites to books and journal articles. Four studies illustrate these points:

- Nederhof et. al (1989) lists the citations per book and journal article for 19 departments; the correlation between the two was 0.32;
- Hicks and Potter (1991) collected a bibliography of 17 authors' output in the field of sociology of scientific knowledge. The correlation coefficient of the citation per book and journal article figures was 0.35;
- Bourke et al. (1996) compared the rankings of departments using total and journal only citation counts. They concluded: "In the social sciences and humanities, the use of journal citation rates as a surrogate for total publication citation rates is more likely to be misleading than in the sciences. It still does, however, provide useful information when used in conjunction with informed peer review" (Bourke et al., 1996, 54);
- More recently, Cronin et al. (1997) constructed a database comprising 30,000 references from 90 books reviewed in top sociology journals and published between 1985 and 1993. Cronin et al. compared lists of the 26 authors most cited in the monographs and in the top 24 sociology journals. They found that nine authors featured on both lists. The five authors ranked 22 to 26 on the book list did not appear among the top 532 authors most cited in the journals.

The low correlations in citation counts combined with the differing highly cited author sets suggests that the journal and book literature form different worlds. That these worlds may overlap but retain a distinct identity is supported by Line. Line found that journal articles referenced more journal articles and books referenced more books. This suggests that the journal and book literatures are somewhat self-contained, although obviously interdependent and overlapping.

Why are there two worlds of social science literature? Perhaps because they carry two types of scholarship; journal articles may reflect a more scientific, and books a more humanities approach to scholarship. Clemens et al.'s study of sociology helps us understand this. Clemens et al. compared book and journal publishing within the context of a long standing debate in sociology. Is sociology professional, technical, cumulative, and convergent as one would gather from its journal literature or is it a diversified, intellectually open endeavor as found in the books? Examining the two types of publishing sheds light on the themes of scientific integrity versus intellectual vitality that underpin the debate.

Clemens et al.'s evidence supported the notion that book and journal publishing form different worlds. Entry into article publishing, they argued, is competitive and so more egalitarian than entry into book publishing, which relies more heavily on patronage, recommendations and reputation. They found that book authors were more likely to be trained and located at elite private universities than were journal article authors. Article authors were more junior than book authors. Articles were more likely to be based upon quantitative evidence and books on qualitative evidence (although books based on quantitative evidence were the most cited of all).

Clemens concluded:

. . . books and articles play different roles. Books are high-stakes endeavors that, when successful, are effective in enrolling allies from neighboring fields. In contrast, articles discipline the troops, generating a common currency of evaluation, be it in comprehensive exams or tenure decisions. To the extent that we care about scholarly reputation, both our discipline's and our own, neither genre should be ignored. (p. 484)

Clemens et al.'s analysis painted a picture of a heterogeneous field of scholarship with distinct journal and book traditions. Journals represent a more scientific type of research and books a more humanities type of scholarship. Because books are more transdisciplinary, very highly cited and often produced by different people than journal articles, SSCI-based analyses will differ from studies that are more inclusive. Bibliometricians ignoring books risk distorting our picture of social science.

3. NATIONAL LITERATURES

The third literature of social science is national. Scientific research transcends national borders, but social sciences are more embedded in their social context because society is their concern. American and European geologists are interested in Iceland's volcanoes, and geneticists learn much from Iceland's genealogical records (Thorsteinsdottir, 1998), but Dutch journals in public administration remain unknown to foreign experts (Nederhof, 1989, p. 338).

Social science research agendas are influenced by national trends and by policy concerns of national governments. Theoretical concepts are subtle and expressed in national languages. They can often be fully appreciated only in the original language. Some disagree, Nederhof argues that: genuine scholarly research in any area leads to results relevant outside the home country. He admits this may be less true for more applied or practical research. Therefore [at least some] outcomes of genuine scholarly research, even those primarily related to national aspects, deserve to be communicated — in an appropriate form — to scholars in other countries as well (p. 513).

In fact, optimists, studying social science literature in the late 1980's found that in the international literature indexed in the SSCI:

With the exception of a minority of topics related to political science, to social issues, and to a lesser extent physical health and geographical location, the large majority of the topics seem to reflect a transnational substantive interest. In addition, the [US and European countries] studied here share many social and political issues. Of course, this may not be true for other countries, and in particular non-Western countries. The present data suggest that the research front on many topics in the social and behavioral sciences is international in the late 1980s . . . Of course, this does not preclude that publications on national issues or national aspects of issues appear in journals or books that address primarily a national audience (p. 271).

It is the final point, publications addressing a national audience, to which I now turn.

To examine the existence and nature of national literatures, I will compare national and international journals. By national journals I mean those not often indexed in the SSCI; which primarily publish articles in a language other than English, and whose authors and readers largely work in that country. International journals include most journals indexed in the SSCI (except parochial US and UK journals which are often indexed); and are largely English language journals whose authors and readers work in many countries.

Bibliometric evidence suggests that both producers and consumers of social science are nationally oriented. Kyvik, studying the writing habits of Norwegian scientists and social scientists in the early 1980's, found that compared to the scientists fewer social scientists published in a foreign language and more published in Norwegian (Kyvik, 1988, p. 165). Taking authors' citation patterns as an indication of their reading habits, Yitzhaki (1998) found that authors over-cite material in their own language. American and British authors cited English language material 99% of the time, although English language sociology probably accounted for 70% of the world

literature. German and French authors cited material in their own language more than 60% of the time although such material accounted for less than 10% of literature in the field.

In a sense then, each national literature is a world unto itself.

In addition, a national literature constitutes a world overlapping to a limited extent with the SSCI. This was strikingly illustrated by an analysis comparing a unique resource, a Polish sociological citation index (PSCI) with the SSCI coverage of Polish sociology. Using a list of Polish sociologists and counting their citations in the Polish index and the SSCI, Webster found that of the top 10 most cited journals in the Polish index, only the three foreign ones are indexed in the SSCI.

- The top 20 most cited documents by Polish sociologists in each index contained none in common. All but one of the SSCI cited documents were in English; all the PSCI cited documents were in Polish.
- The most cited sociologist on the Polish list (with 253 citations) was ranked 41st in the SSCI (with 19 citations). The most cited sociologist on the SSCI list (with 254 citations) was ranked 20th on the PSCI list (with 41 citations);

Webster's analysis illustrated the bibliometric consequences of the limited overlap between national and SSCI literatures. Bibliometric indicators based on foreign literature painted one picture of Polish sociology, and the Polish sociology index another.

Maintaining a database is far more demanding than compiling a list, and so database coverage can be compared against more comprehensive worldwide journal lists. Schoepflin (1990) compared the UNESCO 1986 World List of Social Science Periodicals with the list of journals indexed in the SSCI. At that time UNESCO's list contained 3,515 journals and was 2½ times as long as SSCI's at 1,417. Interestingly, SSCI indexed more American journals than UNESCO, confirming the comprehensiveness of US coverage in the SSCI. The UK is also over-represented in the SSCI. German and French literature is not as well covered in the SSCI, nor is the rest of the world. Schoepflin's work confirms that except for the US and probably the UK, the SSCI and national literatures represent partially overlapping yet different worlds. This work was repeated for 1991 by Narvaez-Berthelemot and Russell who confirmed the result and found the SSCI particularly lacking in coverage of Chinese and Indian social science.

The proportion of a nation's output accounted for in indicators will depend not only on the number of a nation's journals indexed in the SSCI; it will also depend on how often researchers publish in English language international journals. Determining the share of national output indexed in the SSCI is laborious, nevertheless a variety of studies have examined this. The authors report figures covering quite a range (Nederhof, 1993, Burnhill, Butler, Tisjssen, Royle & Over; Pestana, Villagra Rubio, Winterhager). UK economics seems well covered with 73% of its articles indexed (this accords with Schoepflin's analysis). About one-third of Australian and Dutch social science journal output is covered and a less than 5% of Spanish output. Apparently the Spanish publish much more in Spanish than the Dutch do in Dutch.

Except for the US and UK, national social science literatures are largely excluded from the SSCI. SSCI indicators will represent internationally oriented research. Webster summarizes this point well, concluding that the SSCI indicates the presence and the impact of Polish sociology on the international arena, focusing on areas of research done in Poland which are of interest to the international community and the 'best' Polish sociologists and Polish sociological works; but the

SSCI “does not allow for an in-depth analysis of the local dimensions of the discipline”. (Webster, 1998, p. 31)

However, the prospects for social science indicators may be improving as social scientists become more internationally oriented. There are clearly forces working towards the homogenization of social sciences — economic globalization; the internet; European research funding requiring international collaboration; the expansion of the EU, and national level evaluations that emphasize publishing in high impact journals.

Data confirm the trend. Kyvik (2003) found that in the two decades between 1980 and 2000, Norwegian social scientists increased the percentage of their journal articles in English from one-third to one-half. And the percentage of faculty publishing in English increased from one-half to three-quarters. In short, there was a striking increase in social science English language publication. In science, English language publication was already prevalent in 1980 so there was not the striking increase.

Perhaps the most intriguing evidence on increasing internationalization of social science, and hence of the SSCI, is provided by comparing an earlier and later Polish study. The first study covered pre-transition Polish sociology, 1980 to 1988, the second covered pre and post transition sociology. Pre-transition, the SSCI missed 90% of Polish sociologists; post transition, it missed only 30% — a figure much closer to the Polish Sociology Citation Index (PSCI).

The quantitative evidence suggests that the overlap between the worlds of national literatures and the SSCI has increased. At the same time the continued existence and differentiation of national literatures is not in question.

The Polish work suggested that the ascendancy of an international social science may place small-country social scientists in the position of applying other’s frameworks to their societies. Polish sociologists are recognized internationally mostly when their society present picturesque episodes that become fashionable topics in big countries. National communities may develop method and theory, but big-country social scientists remain impervious.

Polish sociologists highly cite:

1. handbooks in general sociology by Polish authors,
2. works on the social structure of Polish society,
3. and works on interesting theoretical or methodological issues.

Works highly cited in the SSCI included:

1. six dealt with theoretical issues, each was at least 20 years old;
2. and the rest dealt with social unrest in Poland in the early 1980s and the fall of Communism in Eastern Europe.

Webster concluded that: “the international sociological community does not notice Polish attempts to tackle universal issues in sociology; it is primarily interested in ‘fashionable’ topics and fads associated with the ‘velvet revolution’ and systemic transformation.” (Webster, 1998, pp. 23-24).

Small country social scientists can be internationally recognized, but perhaps have fewer possible strategies for doing so than US or UK social scientists. Many may choose to pursue topics

which will not interest those in other countries. National literatures will provide a more complete picture of many social science fields in small countries because they will include development of theory and method. Increasing internationalisation may thus work to change the nature of social science in small countries. Ingwersen argued that analysis is possible when the SSCI indexes a reasonable number of a country's papers in a social science field, i.e. as the country's share of world output in the social science field approaches its share in scientific fields. However, as with books, what is missed is not the same as what is counted. One world is delineated; another exists.

4. NON-SCHOLARLY LITERATURE

The fourth literature of social science is non-scholarly or "enlightenment" writing. This is found in periodicals whose goal is knowledge transfer or "enlightenment" of non-specialists. For example, in the US the economist Paul Krugman exerts influence through his *New York Times* column. Burnhill and Tubby-Hille found that in the UK "projects in education [were] reaching practitioners through the *Times Education Supplement*, with researchers in sociology, social administration, and socio-legal studies publishing in such periodicals as *New Society* and *Nursing Times*." Kyvik (2003) found that in Norway one-half of social scientists published contributions to public debate. In contrast, one-quarter to one-third of scientists contributed to public debate.

Where national literatures can develop knowledge in the context of application, non-scholarly publishing moves knowledge into application. The literature therefore performs a function similar to patenting for scientists. But patent systems are indexed, contain citation structures amenable to bibliometric analysis, and have gained respect as a valued output worthy of evaluation. In contrast, non-scholarly literature being also national literature, is less well indexed, does not earn citations and has not yet earned respect as a valued output of scholarly work interacting with application.

Burnhill and Tubby-Hille (1994) investigated this issue in some depth. They constructed a publications database from grant holders' reports to a granting agency, supplemented by a survey. They classified journals as peer-reviewed using two directories that identify peer-reviewed serials, or the judgment of at least two authors. Assigning non peer reviewed journals to the enlightenment category suggests that psychologists, statisticians and geographers do not publish much in non-scholarly literature. Other fields do. Even economics, normally quite scientific in its publication patterns, exhibits a healthy percentage of articles in non-scholarly venues. Linguistics, education and sociology lead in share of non-scholarly publications.

Nederhof et al. (1991) have also looked quite closely at this issue. They surveyed Dutch and foreign scholars asking them about the scholarliness of a number of journals in which Dutch social scientists published. They found that journals considered scholarly in university annual reports were not always considered so by experts. The share of non-scholarly journals ranged from 11% in experimental psychology to 25% in public administration. If departmental output were recounted, including only articles in journals judged scholarly, in the best case one experimental psychology department would have lost only 1% of its output, and in the worst case one public administration department would have lost 61% of its output. Nederhof et al. recalculated the share of articles covered by the SSCI in two ways based on their survey results. They calculated the share of articles in scholarly journals that were indexed in the SSCI, and they calculated the share of 'core' journal articles indexed in the SSCI where core journals were those:

1. known to more than 20% of their respondents;

2. possessing a high scholarly quality (mean of at least 7.5 on a 10 point scale);
3. and found useful to the research of at least 20% of the respondents.

They found that in psychology and linguistics SSCI coverage of the scholarly core is quite comprehensive. However, in the study of Dutch language the identification of a core did not boost SSCI coverage figures much. And in public administration, no core could be identified. Again, we see that the more scientific a field is, the more amenable it is to SSCI coverage. Nevertheless, many social science or humanities fields simply do not have the requisite journal structure.

Schoepflin (1990) reported similar results derived from a survey of German professors asked to rate journals according to their visibility and their perceived value. Of the highly rated journals the SSCI covered: 94% of psychology journals, 26% of sociology journals, and 8% of education journals.

Burnhill and Tubby-Hille found that the SSCI indexed 82% of articles in journals regarded as peer-reviewed by the directories or at least two authors. However, the SSCI coverage dropped to 67% if articles in self-reported 'scholarly' journals were included.

We can take two perspectives on this issue. In the first, we ask: how good is the SSCI as a tool for evaluating disciplinary social science? Clearly, the value of the SSCI for evaluation increases when non-scholarly literature is removed from consideration. However, if we were to accept that it is important for knowledge to interact with application, we would have to accept the importance of enlightenment literature. In recent years, the culture of science has shifted to embrace the value of application and patenting. However, for social scientists this will be more difficult, in part because social science has always interacted with application and an internal tension has developed involving bolstering claims to scientific, and hence scholarly, status by distancing from application. Also, unlike the patent literature, the enlightenment literature has no review and citation mechanisms and so offers no differentiators by quality and extent of use, severely restricting the scope for assessment and evaluation.

5. CONCLUSION

To conclude, in social science there are four distinct literatures: international journal articles, books, national and enlightenment publications. International journal articles are SSCI indexed and are the currency of evaluation around the world. This is not wrong; using journal articles to communicate research results to an international audience is an important part of scholarly work. However, there is more to scholarly work in social science. Books also can have a very high impact. National literature represents knowledge developed in a local context. Enlightenment literature represents knowledge reaching out to application. To add to the problems, each literature is more trans-disciplinary than comparable scientific literature. SSCI bibliometric evaluation must make the best of the low citation rates associated with trans-disciplinary citation scatter and citation accumulation times which are too long for policy makers' purposes. The authors and topics associated with the four literatures overlap, but not completely, so the results of SSCI bibliometrics will not be the same as the results of an evaluation which included all four literatures. An SSCI-based evaluation will be partial and misleading.

However, blanket pessimism about bibliometric evaluation in the social sciences is unwarranted. Fields differ in their characteristics with the economics and psychology literatures quite similar to scientific literatures. An SSCI-based evaluation in these two fields will be quite comprehensive. However, sociology is the classic social science, and SSCI-only evaluations of

sociology will likely be misleading. In addition, citations to books are becoming more accessible. It is possible to search manually in the SSCI for citations from indexed journals to books. Google Scholar permits the same for the literature it indexes, which will overlap to a certain degree with the SSCI literature. Finally, Amazon now indexes the full text of “hundreds of thousands” of books and manual searching there can provide current figures for the rate of book-to-book citation, a particular advantage in the humanities. Also fields change over time. Zwaan and Nederhof (1990) point out that some parts of linguistics have converged towards cognitive science and publication patterns have come to resemble social sciences more than history. Thus core journals can be identified and the average reference has become more recent. Bibliometrics becomes quite tractable, even in this area traditionally viewed as a humanities field.

Finally, scholarship around the world is moving into SSCI indexed journals as scholars try to boost their evaluations, perhaps in the process abandoning the three other literatures in favor of SSCI journals. This trend does make standard bibliometrics more reasonable. Nevertheless, the three other literatures still exist, and SSCI-based evaluations remain partial and misleading. Furthermore, the analysis presented in this paper suggests that a new, SSCI-only social science would differ from the social science of four literatures each serving specific ends. The big picture, integrative work done in books would be neglected, as would the contributions made by social scientists to understanding their own societies and communicating their insights to the public. It would be a tragedy if the intellectual development of the social sciences and its contribution to society were to be stunted. But that may be the ultimate result if in becoming accountable to narrow measures the enterprise is forced into the straight jacket of one of its historical four modes of scholarship and communication.

REFERENCES

- Bourke, P., Butler, L., Biglia, B. (1996). *Monitoring Research in the Periphery: Australia and the ISI Indices*. Research Evaluation and Policy Project, Monograph Series No. 3, Canberra: Australian National University.
- Broadus, R. N. (1971) *The Literature Of The Social Sciences: A Survey Of Citation Studies*. *International Social Sciences Journal*, 23, 236-243.
- Burnhill, P. M., Tubby-Hille M. E. (1994). *On Measuring the Relation between Social Science Research Activity and Research Publication*. *Research Evaluation*, 4, 3, 130-152.
- Clemens, E. S., Powell, W. W., McIlwaine, K., Okamoto, D. (1995). *Careers in Print: Books, Journals, and Scholarly Reputations*. *The American Journal of Sociology*, 101, 2, 433-494.
- Cronin, B., Snyder, H., Atkins. H. (1997). *Comparative Citation Rankings of Authors in Monographic and Journal Literature: A Study of Sociology*. *Journal of Documentation*, 53, 3, 263-273.
- Glänzel W., Schoepflin, U. (1994). *A Stochastic Model for the Ageing Analyses of Scientific Literature*. *Scientometrics*, 30, 1, 49-64.
- Glänzel W., Schoepflin, U. (1995). *A Bibliometric Study on Ageing and Reception Processes of Scientific Literature*. *Journal of Information Science*, 21 (1), 37-53.
- Glänzel, W. (1996). *A Bibliometric Approach to Social Sciences. National Research Performances in Six Selected Social Science Areas, 1990-1992*. *Scientometrics*, 35, 3, 291-307.

- Glänzel W., Schoepflin, U. (1999). A Bibliometric Study of Reference Literature in the Sciences and Social Sciences. *Information Processing and Management*, 35, 31-44.
- Glänzel W., Schubert, A., Schoepflin, U., Czerwon, H. J. (1999). An Item-by-Item Subject Classification of Papers Published in Journals Covered by the SSCI Database Using Reference Analysis. *Scientometrics*, 46, 3, 431-441.
- Godin, B. (2002). The Social Sciences in Canada: What Can We Learn From Bibliometrics? INRS, Working Paper no 1. Quebec, Canada: INRS.
- Hargens, L.L. (2000). Using the Literature: Reference Networks, Reference Contexts, and the Social Structure of Scholarship. *American Sociological Review*, 65, 6, 846-865.
- Hicks, D., Potter, J. (1991). Sociology of Scientific Knowledge: A Reflexive Citation Analysis or Science Disciplines and Disciplining Science. *Social Studies of Science*, 21, 459-501.
- Ingwersen, P. (1997). The Central International Visibility of Danish and Scandinavian Research 1988-1996. A General Overview of Science & Technology, the Humanities and Social Sciences by Online Publication Analysis., 17 p. (CIS Report 5.3).
- Ingwersen, P., Wormell, I. (1999). Publication Behaviour and International Impact: Scandinavian Clinical and Social Medicine 1988-96. *Scientometrics*, 46, 3, 487-499.
- Ingwersen, P. (2000). The International Visibility and Citation Impact of Scandinavian Research Articles in Selected Social Science Fields: the Decay of a Myth. *Scientometrics*, 49, 39-61.
- Ingwersen, P. (2002). Visibility and impact of research in Psychiatry for North European countries in EU, US and world contexts. *Scientometrics*, 54, 131-144.
- Katz, J.S. (1999). Bibliometric indicators and the social sciences. Report prepared for UK Economic and Social Research Council, www.sussex.ac.uk/Users/sylvank/pubs/ESRC.pdf
- Kyvik, S. (1988). Internationality of the Social Sciences: the Norwegian Case. *International Social Science Journal*, 163-172.
- Kyvik, S. (2003). Changing trends in publishing behaviour among university faculty, 1980-2000. *Scientometrics*, 58, 1, 35-48.
- Lewison, G. (2001). Evaluation of books as research outputs in history of medicine. *Research Evaluation*, 10, 2, 89-95.
- Leydesdorff, L. (2003). Can Networks of Journal-Journal Citation be used as Indicators of Change in the Social Sciences? *Journal of Documentation*, 59, 1, 84-104.
- Line, M.B.. (1979). The Influence of the Type of Sources Used on the Results of Citation Analyses. *The Journal of Documentation*, 35, 4, 265-284.
- Luwel, M., Moed, H.F. Nederhof, A.J. De Samblanx, V. Verbrugghen, K., Van Der Wurff, L.J. (1999). Towards indicators of research performance in the social sciences and humanities. An exploratory study in the fields of Law and Linguistics at Flemish Universities. Report of the Flemish Inter-University Council (V.L.I.R.), Brussels, Belgium / Centre for Science and Technology Studies (CWTS), Leiden University, the Netherlands / Ministry of the Flemish Community, Brussels, Belgium. V.L.I.R.: Brussels, Belgium.
- Moed, H.F., Nederhof, A.J., Luwel, M. (2002). Towards performance in the humanities. *Library Trends (Special Issue on Current Theory in Library and Information Science)*. 50, 498-520.

- Narin, F. (1994). Patent Bibliometrics. *Scientometrics*, 30, 1, 147-155.
- Narin, F., Hamilton, K. S., Olivastro, D. (1997). The Increasing Linkage between U.S. Technology and Public Science. *Research Policy*, 26, 3, 317-330.
- Narvaez-Berthelemot, N., Russell, J.M.. (2003) World distribution of social science journals: A view from the periphery. *Scientometrics*, 51, 1, 223-239.
- Nederhof, A.J. (1989). Books and Chapters are Not to Be Neglected in Measuring Research Productivity. *American Psychologist*, 734-735.
- Nederhof, A.J., Zwaan, R.A. DeBruin, R.E. Dekker, P.J. (1989). Assessing the Usefulness of Bibliometric Indicators for the Humanities and the Social and Behavioural Sciences: A Comparative Study. *Scientometrics*, 15, 5-6, 423-435.
- Nederhof, A.J., Zwaan, R.A. (1991). Quality Judgments of Journals as Indicators of Research Performance in the Humanities and the Social and Behavioral Sciences. *Journal of the American Society for Information Science*, 42, 5, 332-340.
- Nederhof, A.J., Meijer, R.F. Moed, H.F., Van Raan, A.F.J.. (1993). Research Performance Indicators for University Departments: A Study of An Agricultural University. *Scientometrics*, 27, 2, 157-178.
- Nederhof, A.J., Van Raan, A.F.J. (1993). A Bibliometric Analysis of Six Economics Research Groups: A Comparison with Peer Review. *Research Policy*, 22, 353-368.
- Nederhof, A. J., Van Wijk, E. (1997). Mapping the Social and Behavioral Sciences World-Wide: Use of Maps in Portfolio Analysis of National Research Efforts. *Scientometrics*, 40, 2, 237-276.
- Nederhof, A. J., Van Wijk, E. (1999). Profiling Institutes: Identifying High Research Performance and Social Relevance in the Social and Behavioral Sciences. *Scientometrics*, 44, 3, 487-506.
- Nederhof, A.J., Luwel, M., Moed, H.F. (2001). Assessing the quality of scholarly journals in linguistics: An alternative to citation-based journal impact factors. *Scientometrics* 51, 1, 241-265.
- Pestaña, A., Gómez, I., Fernández, M.T., Zulueta, M.A., Méndez A. (1995). Scientometric Evaluation of R&D Activities in Medium-Size Institutions: A Case Study Based on the Spanish Scientific Research Council (CSIC). In M. Koenig, A. Bookstein (Eds.), *The Proceedings of the Fifth International Conference of the International Society for Scientometrics and Informetrics* (pp. 425-434).
- Royle, P., Over, R. (1994). The Use of Bibliometric Indicators to Measure the Research Productivity of Australian Academics. *Australian Academic & Research Libraries*, 25, 2, 77-88.
- Schoepflin, U. (1990). Problems of Representativity in the Social Sciences Citation Index. In Weingart, P. Scharinger, R., Winterhager, M. (Eds.), *Representations of Science and Technology, Proceedings of the International Conference on Science and Technology Indicators*, Bielefeld, Germany, 10-12 June, 1992 (pp. 177-188) Leiden: DSWO Press.

- Small, H., Crane, D., (1979). Specialties and Disciplines in Science and Social Science: An Examination of Their Structure Using Citation Indexes. *Scientometrics* 1(5-6), 445-61.
- Thorsteinsdottir, H. (1998). Islands Reaching Out, unpublished DPhil thesis, University of Sussex.
- Villagr a Rubio, A., (1992). Scientific Production of Spanish Universities in the Fields of Social Sciences and Language. *Scientometrics*, 24, 1, 3-19.
- Webster, B.M. (1998). Polish Sociology Citation Index as an Example of Usage of National Citation Indexes in Scientometric Analysis of Social Science. *Journal of Information Science*, 24, 1, 19-32.
- Winclawska, B.M. (1996). Polish Sociology Citation Index (Principles for Creation and the First Results). *Scientometrics*, 35, 3, 387-391.
- Winterhager, M. (1994). Bibliometrische Basisdaten zur Entwicklung der Sozialwissenschaften in Deutschland. in Best, H. et al. (Hrsg.): *Informations-und Wissensverarbeitung in den Sozialwissenschaften*. Opladen 1994, 539-551.
- Yitzhaki, M. (1998). The Language Preference in Sociology. *Scientometrics*, 41, 1-2, 243-254.
- Zwaan, R.A., Nederhof, A.J., (1990). Some aspects of scholarly communication in linguistics: An empirical study. *Language*, 66, 523-527.