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The Four Literatures of Social Science

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THE FOUR LITERATURES OF SOCIAL SCIENCE

Handbook of Quantitative Science and Technology Research, ed. Henk Moed, Kluwer Academic.

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This chapter reviews bibliometric studies of the social sciences and humanities. SSCI bibliometrics will work reasonably well in economics and psychology whose literature shares many characteristics with science, and less well in sociology, characterized by a typical social science literature. The premise of the chapter is that quantitative evaluation of research output faces severe methodological difficulties in fields whose literature differs in nature from scientific literature. Bibliometric evaluations are based on international journal literature indexed in the SSCI, but social scientists also publish books, and write for national journals and for the non-scholarly press. These literatures form distinct, yet partially overlapping worlds each serving a different purpose. For example, national journals communicate with a local scholarly community, and the non-scholarly press represents research in interaction with contexts of application. Each literature is more transdisciplinary than its scientific counterpart, which itself poses methodological challenges. The nature and role of each of the literatures will be explored here, and the chapter will argue that by ignoring the three other literatures of social science, bibliometric evaluation produces a distorted picture of social science fields.

1. INTRODUCTION

Bibliometrics provides powerful tools for the evaluation of scientific research. The application of bibliometric method to research in disciplinary areas in which consensus is reached has become almost routine. Bibliometric work is facilitated in such areas because their literature exhibits certain characteristics: research is published predominantly in English language journals and references predominantly recent papers in a set of core journals recognized for their high quality and impact. Thus a focused body of citations is generated that is fairly current and is accessible if a bounded set of journals is indexed. The *Science Citation Index* of course takes advantage of these characteristics to provide the indispensable basis for citation analysis of scientific output. If research outcomes are to be evaluated, patents and their citations to scientific literature are available (Narin, 1997) and these are almost as well indexed and well behaved as the journal literature. They are also becoming more useful as more and more public sector researchers patent (Hicks et al., 2001).

When challenged to evaluate scholarly work in the social sciences and humanities, we are rudely forced to work outside this comfort zone in a frankly messy set of literature. In the humanities, book publishing predominates, and even today, books and their references are not indexed in a database. In the social sciences, indexed English language journal publication coexists with non-indexed book publishing, national literature and non-scholarly literature. In the humanities, referencing is archival (de Solla Price, 1970) and citations accumulate at a geological pace from the perspective of policy makers. In the social sciences, referencing mixes archival and current patterns and the referencing pattern is quite scattered, lacking focus. A core literature is less clearly delineated.

This chapter will interpret the situation within the Mode 2 framework. Mode 2 is the simplification of the argument first put forth by Gibbons et al., namely that:

The old paradigm of scientific discovery ('Mode 1') characterised by the hegemony of disciplinary science, with its strong sense of an internal hierarchy between the disciplines and driven by the autonomy of scientists and their host institutions, the universities, was being superseded – although not replaced- by a new paradigm of knowledge production ('Mode 2') which was socially distributed, application-oriented, trans-disciplinary and subject to multiple accountabilities. (Nowotny, Scott and Gibbons, 2003, p. 1)

Nowotny, Scott and Gibbons (2001) note the pervasiveness of processes of audit, assessment and evaluation in Mode 2. Bibliometrics has proved remarkably adept in implementing this agenda in the sciences. Thus, bibliometrics is asked to extend itself into social science and humanities. Ironically, this tool of the Mode 2 "audit culture" works best on traditional Mode 1 science areas.

In confronting the social sciences in particular, I will argue that bibliometrics confronts evaluating aspects of Mode 2 research. The chapter examines the four literatures of social science: journal article, books, national and non-scholarly literature. The discussion explores their relationship to scientific and humanities scholarship and to transdisciplinarity and contexts of application. The chapter will examine the methodological problems of the four literatures and will assess the success of efforts to resolve the problems and the consequences of ignoring them.

Note that "social science" or "humanities" will not be analyzed here because generalizations at that level are of limited use. The bibliometric literature takes a more nuanced approach, examining issues at the field level, which has proved valuable. In almost every study, the psychology and economics literatures are found to be most science-like in contrast with the sociology literature. Also, fields change over time. Zwann 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. We should beware of very old studies, as their results may not reflect the current situation.

2. JOURNAL ARTICLES

The first literature of social science comprises internationally oriented, largely English language, peer-reviewed journal articles. The SSCI indexes these, enabling evaluations applying classic bibliometric technique whose authors acknowledge to varying degrees their exclusion of the three other literatures.

Glanzel (1996) worked from the full SSCI database to produce tables listing countries' publication and citation counts and shares, and citation per paper indices between 1990 and 1992. Glanzel recognized the substantive methodological problems arising from the nature of the social science literature, and proposed that his SSCI-based indicators be interpreted cautiously. In his methodological work, Glanzel has devoted considerable attention to the time distribution of citations. In this evaluation, he was forced to acknowledge that although a decade long citation window would be needed to capture the slow accumulation of citations in social science, from the evaluation perspective, such methodological rigor would produce an obsolete result. Glanzel compromised with a shorter window and as a result compared to SCI data "mean citation rates are . . . small, and the share of uncited literature is considerable"¹ (Glanzel, 1996, p. 293).

¹ Field differences in citation aging have also been studied. Price (1970) noted that fields differ in the percentage of references that are less than five years old. This metric clearly distinguished between humanities and science fields, but did not clearly demarcate social sciences from science fields. In a series of studies, Glanzel and Schoepflin (1994, 1995, 1999) examined the age of references on papers by field. They established that

Ingwersen in a series of papers examines at the national level Scandinavian publication and impact in social science and medical areas. Ingwersen begins with on-line publication counts and later moves to the ISI's National Science Indicators product (NSI) containing national level summary publication counts. All of the papers compare Nordic countries with the world and with each other in publication output and citation impact by field within social science or health areas. The countries tend to produce high impact work in the health sciences and each has individual strengths in social science areas. In some cases trends and strengths could be connected with policy, for example the connection between strong social welfare states and strength in health sciences. As for methodological awareness, Ingwersen 2000, an NSI based analysis of traditional social science fields, finds that Scandinavian output is increasing and in many cases a country's share of ISI literature is comparable to their share of scientific literature. While admitting to the continuing Anglo-American bias of the database, Ingwersen concludes that increased publication output by small countries in the SSCI makes it increasingly relevant for analysis of non-US countries in five to seven of the nine fields examined. (Ingwersen, 1997, 2000, 2002, Ingwersen & Wormell, 1999)

Katz (1999) worked from the NSI to compare 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. In examining citations, Katz argued that a linear normalization, i.e. citations per paper, is inadequate because citation counts increase non-linearly with size of the publication pool. He introduced a corrected indicator more favorable for small countries. On methodological issues, Katz incorporated much of Hicks 1999 to conclude: "bibliometric indicators may provide a reasonable measure of the size and impact of international and scholarly social science research in some fields like psychology and economics" (p. 4). The report focused on psychology and economics.

Godin (2002) works from the full database. He counted Canadian papers by province, by sector and by field, and counts collaborations at the sector level. He identified health and psychology as areas of Canadian specialization. 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%. This was seen as evidence that the SSCI was useful for social science evaluation.

The most detailed and methodologically careful evaluations of social science and humanities research have been undertaken by the Leiden group, Nederhof in particular. The group's work has been guided by conversations with topic experts, methodological issues were always acknowledged, and the analysis has been deeper than is typical elsewhere.

In the late 1990s, Nederhof and Van Wijk mapped social and behavioral science topics and disciplines using the SSCI. They generated maps by clustering a matrix whose rows listed topics (title words) and whose columns listed disciplines (a consolidation of ISI's journal classification scheme). Two maps were analyzed, a dynamic and a static map. The dynamic map was built using words whose frequency changed greatly. The static map was built from the 100 most frequently occurring non-trivial words. In one paper, the authors examined Dutch areas of strength and weakness. They found that Dutch performance had

the distribution of average age of references did not differ between the SCI and SSCI. In the SCI, fields like immunology build quickly on previous work, while engineering fields and mathematics move more slowly. In the SSCI, some fields are relatively swift; information and library sciences had a lower mean reference age than solid state physics and mathematics.

However, at the level of the journal and the full distribution of citations over time, the picture is more nuanced. Self-citations always arrive quickly, the number peaking at two years and dropping off sharply thereafter. For other citations the distribution over time varies by field. For some journals in the sciences, citation is swift, mimicking the self-citation distribution. For social science, psychology and mathematics journals, 4 or 5 years are needed for a paper to achieve its citation peak and this maximum rate of citation is sustained for up to a decade with little decay. The methodological implication is that while a 2 or 3 year citation window may be adequate in fast moving science areas, it will distort results in studies of the social sciences.

some strong areas, but was slightly disappointing overall (Nederhof & Van Wijk, 1997). In another publication, the authors dug deeper into the maps to profile Dutch institutes. This necessitated adding back into the analysis topics missed in the quite selective mapping process. The results were quite complex and suffered from thin citation – in some cases a well cited output had two citations (Nederhof & Van Wijk, 1999).

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. *Bourke, Butler & Biglia* examined two bibliographies each covering all Australian university research output. They found that natural scientists published about 85% of the time in journal articles or published conference papers; while 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 (*Bourke et al.*, 1996). *Pestaña, Gómez, Fernández, Zulueta & Méndez* examined Annual Reports to construct a bibliography of the research output of the Spanish Scientific Research Council (CSIC). The CSIC’s seven natural science divisions published 81% of their output in journals and the one humanities/social science division 54% (*Pestaña et al.*, 1995). *Winterhager* has examined German sociology publishing in the German SOLIS database and found that 42% is published in journals (*Winterhager*, 1994). Thus, journal-based bibliometric indicators will be based on a smaller fraction of research output in the social sciences than in the natural sciences.

Nederhof took this point very seriously in his project analyzing the research activities of four major Flemish universities in law and linguistics. The study included no citation information nor did it draw evaluative comparisons among 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 among scholars, complex self-reported sub-disciplines 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 that overcome some of the methodological concerns haunting pure SSCI work (Luwel et al., 1999; Nederhof et al., 2001; Moed et al., 2002).

Lewis in 2001 also addressed these concerns in his evaluation of UK output in a humanities field – history of medicine – that focused on assessing book output. Lists of books in the history of medicine were compiled from book reviews and from references in papers listed in the SSCI. Author addresses were gathered from SSCI papers and one-quarter of the books could be assigned to countries in this way. Citations in the SSCI and book reviews (indexed in the SSCI and so easily accessible) were counted. The UK was found to be increasingly strong in the field, supporting the results of an international series of interviews. Methodologically, the counts of reviews and citations did not correlate, in fact there was little overlap between books that were reviewed and cited. When asked, historians responded that reading a book is the best way to evaluate it, followed by reading a review and then by number of citations. Number of reviews ranked considerably lower on the list.

Non-journal publishing is significant in the social sciences. Some have wrestled with this problem; others have acknowledged it. In addition to non-journal publishing, a second factor compromises SSCI-based evaluations – the robust transdisciplinarity of much social science. The bibliometric evidence for this transdisciplinarity is found in widely scattered citation patterns. Beginning at the broadest level, Leydesdorff reports that 79% of references from

papers indexed in the SCI are references to other papers indexed in the SCI. In contrast, 45% of references from papers indexed in the SSCI are within the database (Leydesdorff, 2003).

Small and Crane (1979) conducted a co-citation clustering of high-energy physics, psychology, economics and sociology 1972-1974 using the full SCI and SSCI. Examining the characteristics of the resulting clusters, they found strong evidence of transdisciplinarity in sociology compared with the other areas. For example, 97% (all but one) of the sociology clusters was considered interdisciplinary in that less than 2/3 of the citing papers were in sociology journals. In contrast, in psychology and economics a smaller proportion of the clusters were interdisciplinary using the same criterion (71% and 64% respectively). Examining co-citation links between clusters in the disciplines revealed that economics clusters were substantially more strongly linked to each other than were the sociology clusters. Examining links between clusters and other disciplines revealed that sociology clusters have more connections with other fields than does economics. Small and Crane's work revealed that in comparison with economics, sociology's citing patterns were less focused on literature in the same field. Sociology clusters were less strongly linked to each other and more strongly linked to clusters in other fields. Thus sociology was more transdisciplinary than economics.

Similar evidence of transdisciplinarity emerged from a study by Glanzel et al. (1999). These authors also analyzed references in the SSCI, using them to attempt to classify papers based on the subject classification of journals they referenced. The technique aimed to classify papers in journals selectively covered by the SSCI, which are not assigned to fields. The authors counted references to journals that had been classified into business, economics, law, political science, psychology, sociology or information & library science. The field referenced most often was used as the new classification of the paper if its share of references exceeded 50%. If there were no references to these fields, or no field gathered 50% of the references, the paper could not be classified. In all, 28% of the papers could be assigned to a social science field. That 70% of papers could not be classified speaks to their transdisciplinary nature. Interestingly, the method was also applied to two disciplinary journals. 25% of the papers in the *American Sociological Review* (ASR) could not be classified as sociology while 6% of papers in *Developmental Psychology* could not be assigned to psychology. Sociology again appears more transdisciplinary than a comparison field, in this case psychology.

Broad, unfocused citing fragments the literature such that in the worst cases, no core of literature in a field can be identified (*Nederhof et al.*, 1989). A database such as the SSCI must have an internationally recognized core literature to work with to achieve comprehensive international coverage. Low SSCI coverage of a journal literature may signal no core literature. We might expect fragmentation to vary by field, and less transdisciplinary fields to be the least fragmented, and 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 their coverage figures. Table 1 reports *Nederhof et al.*'s (1989) finding that coverage of Dutch output ranged from 62% of journal articles in experimental psychology to 2% in public administration. Table 2 reports *Butler*'s findings (personal communication of unpublished data, 1998) that coverage of Australian anthropology, archaeology, philosophy, law and economics was more than 40%. In contrast, only 25% of history was covered. In *Butler*'s data there was an inverse correlation (-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 transdisciplinary argument by linking a lack of core literature and the presence of many books. If transdisciplinarity varies by field, then fields with a higher share of books according to *Pierce* (1987) should have less core journal literature according to *Nederhof et al.* (1989). In *Butler*'s data, economics and anthropology &

archaeology exhibited the highest share of articles covered and a low share of books while history exhibited the opposite pattern.

Table -1. SSCI coverage by field - Nederhof 89, Dutch Social Science

Field	% of articles in SSCI	% publications in books
Experimental Psychology	62	30
General Linguistics	21	40
Anthropology	15	38
Dutch Language	10	25
Social History	10	40
Public Administration	2	36

Table -2. SSCI coverage by field - Butler, Australian social science

Field	Number of articles	% articles in SSCI	% publications in books
Anthropology & Archaeology	281	44	6
Economics	1074	43	4
Philosophy & Law	418	43	8
Geography	390	39	5
Sociology	649	32	9
Political Science	690	27	8
Asian History	220	27	10
History	532	25	12
Total	4254	35	7

3. BOOKS

The second literature of social science is books. The association between books and transdisciplinarity is supported by citation evidence. In 1971, *Broadus* surveyed the literature of citation studies in the social sciences and found 11 studies, 6 of which used books (technically monographs) as sources of citations. He found evidence that books referenced more widely than journal articles. That is, in comparison to a journal article, a higher percentage of references from a book will be to work outside its specialty (*Broadus*, 1971, p. 238). Looking at citations gathered by books, Clemens' et al. studied sociology and reported that books received the majority of citations from outside the discipline of sociology. In the least cited quartile, books received 54.5% of their citations from outside sociology compared with 16% of citations to journal articles. In the most cited quartile, books received 79% of their citations from outside sociology and articles 55%.

The transdisciplinarity of books suggests that the book and journal literatures differ, a point pursued further below. However, books are a small percentage of social science output, and so one might choose to ignore them. The reason one cannot is that books have a high impact in social science. *Broadus'* review found that references to monographs ranged from 31% to 56% of references from book and journal literature in a variety of fields. He compared this with a 1939 study showing chemists gave 5% of their references to monographs and physicists 8% (*Broadus*, 1971, p. 241). 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

Thus, books are ignored in studies of science, but in social science although a relatively small percentage of output, they account for a substantial proportion of citations in the SSCI - as much as 40%. Indicators built from SSCI indexed material - journal articles and citations to them - will miss the 40% of citations received by books.

Books can be very highly cited:

- Hicks and Potter (1991) examined a bibliography of sociology of scientific knowledge and found that on average journal articles received 1.2 citations and books 5.7 citations.
- *Clemens et al. (1995)* compares the citation rate of elite publications: papers published in the two leading American sociology journals – American Sociological Review and American Journal of Sociology in 1987 and 1988 – and 80 books nominated for the American Sociological Association’s Distinguished Scholarly Publication award. They find that “books are clearly cited more frequently than journal articles by a ration of 3:1” p. 459. Citations to the 20 most cited articles ranged from 16 to 55 while citations to the 20 most cited books ranged from 34 to 512.
- Bourke et al. (1996) examined research output 1989-93 for social sciences at the Australian National University and found that on average journal articles received 0.9 citations and books 5.2 citations.
- *Thomas (1998)* collected a bibliography of 300 items published by leading authors in organizational behavior between 1956 and 1975. The 33 most cited items were books.
- *Webster’s (1998)* lists of most cited Polish sociology documents are mostly books – 11 out of 15 cited in the SSCI and 18 out of 19 cited in the Polish Sociology Citation Index.

This evidence establishes that books are high impact, and thus under the rules of bibliometrics should not be ignored. The danger of ignoring books is further illustrated by exploring the differences between the worlds of book and journal publishing. Books are not just large 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 & 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.² 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 randomly chosen from those 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.³ 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’s work. Line constructed a set of 59,000 references, 11,041 from monographs and 47,925 from journals.⁴ Line found that

² Journal citation counts included citations to ISI and non-ISI journals

³ ISI’s impact factor was used to identify the top journals. 26 authors exceeded Cronin’s minimum threshold of 27 citations in total, or an average of three per year.

⁴ Monographs and journal articles published 1970-1971.

compared to journals, monographs referenced proportionally fewer journal articles and more monographs and other types of literature. This suggests that the journal and book literatures are somewhat self-contained, although obviously interdependent and overlapping.

Table -3. References made by journals and monographs to other forms of material (source Line, 1979, p. 274)

Forms of material cited	Source material	
	Journal articles	Monographs
Journal articles	47%	25%
Monographs	39%	51%
Other newspapers, unpublished etc.)	14%	24%
Total	100%	100%

The different types of scholarship they represent may explain why two worlds of literature coexist. Journal articles may reflect a more scientific and books a more humanities-type 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 the field 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. Thus, 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 (though books based on quantitative evidence were the most cited of all).

They concluded:

. . . books and articles play different roles. Books are high-stakes endeavors that, when successful, are effective in enrolling allies from neighboring fields. Articles, in contrast, 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. Both are transdisciplinary, books more so. Because books are very highly cited and often produced by different people than journal articles, SSCI-based analyses will differ from more inclusive studies. Bibliometricians ignoring books risk distorting our picture of social science.

4. NATIONAL LITERATURES

The third literature of social science is national. 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). In contrast to science, social sciences are more embedded in their social context because society is their concern. Social science research agendas are influenced by national trends and by policy concerns of the national government. Theoretical concepts are subtle, and without the unifying language of mathematics, are expressed in national languages and can often be fully appreciated only in the original language. Countering this, *Nederhof* argues that:

Genuine scholarly research, regardless of the sub-discipline and the object of research, leads to results the relevance and implications of which go beyond a purely national viewpoint or interest. This may be less so for contributions of a more applied or practical nature. 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).

This section examines the existence and nature of national literatures. Here, national and international literatures are juxtaposed. National journals are those that are not often indexed in the SSCI; that primarily, though not exclusively, publish articles in the native language (not English) of their country of publication, and whose authors and readers largely work in that country. International journals include most journals indexed in the SSCI (though parochial U.S. and UK journals are often SSCI 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. Research shows that compared to natural scientists, social scientists both write for and read fewer foreign language or even foreign journals. *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).⁵ 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.⁶ 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. However, Nederhof et al. (1989) emphasized that visibility depends less on writing in the English language than it does on publishing in an international journal. That is, the impact of English language papers in Dutch journals is not higher than the impact of other papers in Dutch journals. 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 as was well illustrated by *Webster/Winclawska's* analysis of a Polish sociological citation index (PSCI) (*Webster*, 1998; *Winclawska*, 1996).⁷ In the first analysis, *Winclawska* began with a list of Polish sociologists and counted their citations in the international SSCI and the Polish index between 1980 and 1988. She found that of the top 10 most cited journals in the Polish index, only the three foreign ones are indexed in the SSCI.

In the second analysis the author, now *Webster*, counted citations to Polish sociologists between 1981 and 1995. She found:

- Lists of the top 20 most cited Polish sociologists in each index had 12 names in common. 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).

⁵ Tenured academics at Norwegian universities who published scientific work during 1979-81 were studied. 54% of social scientists published in a foreign language while 80% of natural scientists did; conversely, 75% of social scientists but only 35% of natural scientists published in Norwegian

⁶ References collected from one US and three UK journals. A fourth journal diverged from this pattern. Articles in the British journal *Theory, Culture and Society* gave 10% of their references to non-English language material. Estimate of English language share of sociology publications derived from SOCIOFILE produced by Sociological Abstracts Inc.

⁷ The PSCI was constructed from the four leading Polish sociological journals. The SSCI does not index any Polish journals, and these four were not cited in the SSCI between 1980 and 1988.

- Lists of 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.

Webster/Winclawska's analyses 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. Table 4 below is taken from Schoepflin's article. It compares the number of journals produced in the US, UK, Germany and France that appear on the UNESCO list and in the SSCI. At that time, UNESCO's list at 3,515 journals 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 at 18%. 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.

Table -4. Comparison of SSCI and UNESCO journal lists

Country	Number of Journals		Percentage share	
	SSCI	UNESCO	SSCI	UNESCO
USA	852	> 611	60	> 17
UK	256	< 334	18	> 10
Germany	48	< 184	3	< 5
France	25	< 269	2	< 8
Rest of world	236	< 2117	17	< 60
Total	1417	< 3515	100	= 100

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. Table 5 summarizes the relevant parts of these studies, presenting the percentage of social science journal output indexed in the SSCI for a variety of countries.

There is quite a range in the figures. UK economics seems well covered with 73% of its articles indexed (*Nederhof and Van Raan, 1993*). This accords with *Schoepflin's* analysis which showed UK journals are relatively well covered. About one-third of Australian and Dutch social science journal output is covered (*Butler (1998), Tijssen et al. (1996), Royle & Over (1994)*) and a small percentage of Spanish output (*Pestaña et al. (1992), Villagr a Rubio (1992)*). Apparently, the Spanish publish much more in Spanish than the Dutch do in Dutch.

Table -5. SSCI article coverage

Study	Country (number of country's journals indexed in SSCI)	Number of journal articles	% of journal articles in SSCI	% of all publications in SSCI
Nederhof 93	UK (278) – economics only	193	73	27
Burnhill	UK (278)	468	46	22
Butler	Australia (20)	4254	35	
Tijssen	Netherlands (83 - 3 Dutch)	all Dutch ⁸	30	
Royle & Over	Australia (20)	1901	27 ⁹	
Pestaña	Spain (3)	1242	4	2

⁸ Elsevier English language journals are attributed to the Netherlands.

⁹ Comparable figure for science: 74% of 6304 articles indexed in SCI.

Study	Country (number of country's journals indexed in SSCI)	Number of journal articles	% of journal articles in SSCI	% of all publications in SSCI
Villagra Rubio	Spain (3)	3757	1 ¹⁰	1
Winterhager	Germany (52)	49446		25

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 is some bibliometric evidence on this point from the studies reviewed here:

- *Pestaña et al.* (1995) mention that the Spanish CSIC research output is growing more international, though they do not say if this trend is strong in the social sciences sections.
- *Van der Meulen* and *Leydesdorff* found that the proportion of Dutch philosopher's output published in foreign, scholarly journals increased from 3% to 17% between 1979-80 and 1984-85 (*Van der Meulen* and *Leydesdorff*, 1991, p. 309).

There are clearly forces working towards the homogenization of social sciences – economic globalization; the internet; European research funding that requires international collaboration; the transitions of East and Central European nations that freed communication and travel, and national level evaluations that emphasize publishing in high impact journals (such as the UK Research Assessment Exercise).

In fact, in *Nederhof* and *Van Wijk's* (1997) word-based topic clustering in the late 1980's (described earlier) the authors 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).

Perhaps the most intriguing evidence on increasing internationalisation of social science and hence of the SSCI is provided by comparing the *Winclawska* and *Webster* studies. Her first study covered pre-transition Polish sociology, 1980 to 1988, her second covered pre & 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. Note the heavy caveats on *Nederhof* and *Van Wijk's* statement above; in addition *Webster's* work added nuance to the argument. *Webster's* 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, recognized internationally mostly when their societies present picturesque episodes

¹⁰ Strictly speaking this is percentage in "international journals", i.e. those indexed in any of 11 international databases including Social Scisearch.

that become fashionable topics in big countries. National communities may develop method and theory, but big-country social scientists remain impervious. This conclusion was suggested by comparing the topics of the works most highly cited in the PSCI and SSCI. Polish sociologists highly cited (in articles published in the four Polish journals indexed in the PSCI) handbooks in general sociology by Polish authors, works on the social structure of Polish society, and works on interesting theoretical or methodological issues. Works highly cited in the SSCI included: 6 dealing with theoretical issues, each at least 20 years old; and the rest dealing 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 U.S. or U.K social scientists. Many may choose to pursue topics that 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 theoretical and methodological development. Increasing internationalisation may thus work to change the nature of social science in small countries. Ingwersen argued that analysis is possible when the number of a country’s papers in a social science field that are indexed in the SSCI becomes reasonable, 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.

5. NON-SCHOLARLY LITERATURE

The fourth literature of social science comprises non-scholarly works. Non-scholarly journals are those “usually directed at non-specialists such as high school teachers or, in short, the general public . . .” They are devoted to enlightenment or knowledge transfer to the non-scholarly public (Nederhof and Zwaan, 1991, p. 335).¹¹ In the U.S., 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 such periodicals as the *Times Education Supplement*, with researchers in sociology, social administration and socio-legal studies publishing in such periodicals as *New Society* and *Nursing Times*.” (*Burnhill* and *Tubby-Hille*, 1994, p. 142) Where national literatures develop knowledge in the context of application, publishing in non-scholarly journals moves knowledge into application. The literature therefore performs a function similar to patenting for scientists. But patent systems are indexed, can contain citation structures amenable to bibliometric analysis and have gained respect as a valued output worthy of evaluation (Narin, 1994). In contrast, non-scholarly literature, being also national literature, is less well indexed, does not earn citations¹² and has not yet earned respect as a valued output of scholarly work interacting with application.

Burnhill and *Tubby-Hille* (1994) have investigated this issue in some depth. Their publications database was constructed from end-of-award reports of grant holders to the granting agency, supplemented by a survey. They checked whether listed journals were peer-reviewed using two directories of periodicals which identify peer-reviewed serials – EBSCO

¹¹ Such journals are of more interest than what might be termed “pseudo-scholarly” literature, an example of which would be a philosophy journal produced by one university and publishing primarily the work of that university’s scholars (*Van der Meulen & Leydesdorff*, 1991, p. 312).

¹² Except for the *New York Times*, which is extremely highly cited in the SSCI thus indicating a healthy interaction with application.

and Ulrich's.¹³ *Burnhill* and *Tubby-Hille* then examined SSCI coverage of "peer-reviewed" journals. 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.

Burnhill and *Tubby-Hille* did not report SSCI coverage by field. However, they did report scholarliness of articles by field (Table 6). In this table, "peer-reviewed" means articles in journals judged to be peer reviewed by the directories or by two or more authors. "Authors consider scholarly," means an author reported the article to have been peer reviewed on the survey. "Other" is remaining journal articles. Psychologists, statisticians and geographers do not publish much in non-scholarly literature. Other fields do. Economics here diverges from its more general pattern of scientific type publishing with a healthy percentage of articles in non-scholarly venues. Linguistics, education and sociology lead in share of non-scholarly publications.

Table -6. Scholarliness of journal articles by field - Burnhill & Tubby-Hille, UK social science

Field	% of journal articles(468 total across all fields)			% of total publications Books
	Peer-reviewed	Authors consider scholarly	Other	
Psychology	87	7	5	11
Statistics/computational methods	75	13	13	8
Geography & planning	73	19	8	7
Political science & international relations	64	8	28	29
Economics	64	6	30	10
Social anthropology	63	0	37	22
Management & business studies	60	12	29	10
Education	48	11	40	14
Sociology/ social administration	48	11	41	17
Economic & social history	44	20	37	24
Linguistics	23	15	62	20
All social science	62	13	26	15

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 reports¹⁴ 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

¹³ The survey also asked authors whether the publications they listed were peer-reviewed. The authors and the directories agreed on 62% of the journals. (This includes an element of missing information on the surveys.) Only 42% of journals believed by authors to require peer review were so classified by EBSCO or Ulrich's. *Burnhill* and *Tubby-Hille* concluded that neither the survey nor the directories are wholly accurate. The two directories were: EBSCO, *The Serials Directory: An International Reference Yearbook* (EBSCO Publishing Seventh Edition, Birmingham, Alabama, 1993) and Ulrich's *International Periodicals Directory, 1992-1993* (RR Bowker, New Jersey, 1993).

¹⁴ The source for most bibliographies underlying the studies covered in this paper.

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.

Table 7 displays their results. The table shows that when just the scholarly core of a field is considered, SSCI coverage can be quite comprehensive. However, some fields remain mostly local in orientation. In public administration, a core literature could not even be identified.

Table -7 Share of articles indexed in SSCI by journal type - Dutch Social Science (% and number of articles)

Field	University Annual Reports	Scholarly journals	Core journals
Experimental psychology	58 (260)	69 (257)	100
General linguistics	21 (38)	22 (38)	85
Dutch language	10 (27)	11 (27)	20
Public Administration	3 (12)	5 (12)	no core

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 journal and 8% of education journals.

We can take two perspectives on this issue. In the first we ask: how good is the SSCI as a tool to evaluate mode I 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 the mode II emphasis on knowledge in interaction 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.

6. CONCLUSION

In social science there are four distinct literatures: international journal articles, books, national and non-scholarly 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 and the humanities. Books also can have a very high impact. National literature represents knowledge developed in a local context. Non-scholarly literature represents knowledge reaching out to application. To add to the problems, each literature is more transdisciplinary than comparable scientific literature. SSCI bibliometric evaluation must make the best of the low citation rates associated with transdisciplinary citation scatter and citation accumulation times that 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 ideal evaluation that included all four literatures.

All is not lost however, fields differ in their characteristics with the economics and psychology literatures quite similar to scientific literatures, sociology being a paradigmatic social science literature and history representing humanities. SSCI-based bibliometrics will work best when applied to science-like literatures like economics and psychology.

Although scholarship around the world is moving into SSCI indexed journals making standard bibliometrics more reasonable, the three other literatures still exist. If scholars seek to bolster their evaluations by abandoning the three other literatures in favor of SSCI journals, the resulting social science will differ from the social science of four literatures each serving specific ends.

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.
- De Solla Price D.J. (1970). *Citation measures of hard science, soft science, technology, and non-science*. In C.E. Nelson, D.K. Pollak (Eds.), *Communication among Scientists and Engineers* (pp. 1-12) Lexington, Mass: Heat.
- Gibbons M., Limoges C., Nowotny H., Schwartzman S., Scott P., Trow M. (1994). *The New Production of Knowledge. The Dynamics of Science and Research in Contemporary Societies*. London: Sage.
- 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.
- Hicks, D., Potter, J. (1991). Sociology of Scientific Knowledge: A Reflexive Citation Analysis of Science Disciplines and Disciplining Science. *Social Studies of Science*, 21, 459-501.
- Hicks, D. (1999). The Difficulty of Achieving Full Coverage of International Social Science Literature and the Bibliometric Consequences. *Scientometrics*, 44, 2, 193-215.
- Hicks, D., Breitzman, A., Olivastro, D., Hamilton, K. (2001). The Changing Composition of Innovative Activity in the U.S.--A Portrait Based on Patent Analysis. *Research Policy*, 30, 681-703.
- 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.
- Lewis, 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.
- 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.
- Nowotny, H., P. Scott, Gibbons, M. (2001). *Re-thinking Science*. Cambridge, UK: Polity Press.
- Nowotny, H., P. Scott, Gibbons, M. (2003). *Re-thinking Science: Mode 2 in Societal Context*. http://www.nowotny.ethz.ch/pdf/Nowotny_Gibbons_Scott_Mode2.pdf.
- 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).
- Pierce, S. (1987). Characteristics of Professional Knowledge Structures: Some Theoretical Implications of Citation Studies. *LISR*, 9, 143-171.
- 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., Sehringer, 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.
- Thomas, P. (1998). *A Bibliometric Analysis Of Fashions In Management Literature*, PhD thesis, Nottingham Trent University.
- Thorsteinsdottir, H. (1998). *Islands Reaching Out*, unpublished DPhil thesis, University of Sussex.
- Tijssen, R.J.W., Van Leeuwen, Th.N., Verspagen, B., Slabbers, M. (1996). *Wetenschappen Technologie-Indicatoren 1996*, Het Nederlands Observatorium van Wetenschap en Technologie: Centrum voor Wetenschap – en Technologie-Studies (CWTS) en Maastricht Economic Research Institute on Innovation and Technology (MERIT) in opdracht van het Ministerie van Onderwijs, Cultuur en Wetenschappen, Zoetermeer, (ISBN 90-75023-03-0), 223p.

- Van Der Meulen, B., Leydesdorff, L. (1991). Has the Study of Philosophy at Dutch Universities Changed Under Economic and Political Pressures? *Science, Technology, & Human Values*, 16, 3, 288-321.
- 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.

APPENDIX A

Data sources and method for Table 5

Study	Data source
Bourke et al. 96	IAS95 - Database of research output 1989 to 1993 for the Research School of Social Sciences (RSSH) and Research School of Pacific (and Asian) Studies (RSPAS), Institute of Advanced Studies (IAS), at the Australian National University (ANU).
Burnhill	All publications related to research grants of the UK Economic and Social Research Council (ESRC) in 1984-85.
Butler	IAS95 database though with some non-ANU university papers included, figures from personal communication
Hicks & Potter 91	Bibliography of sociology of scientific knowledge collected by snowball method.
Nederhof, 89	Bibliographies of Dutch university output in eight fields constructed by correcting lists obtained from university annual reports. All figures averaged across the eight fields.
Nederhof et al., 93	Grant related bibliographies of six British economics research groups
Pestaña	bibliography constructed from Annual Reports of the Spanish Scientific Research Council (CSIC) 1990-92
Royle & Over	bibliography of articles published in journals or serials constructed from the 1990 and 1991 Annual Reports of La Trobe University, Monash University and University of Melbourne
Tijssen	research papers of Dutch universities, personal communication
Villagra Rubio 92	Database of Spanish university journal and book output in economics, sociology, political science, linguistics and literary sciences derived from the ECOSOC database which contains all articles in Spanish journals and the ISBN database, the official bibliography of Spanish books. These were supplemented with searches in 11 international databases including Social Scisearch.
Winterhager	Das Sozialwissenschaftliche Literaturinformationssystem (SOLIS)