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CONTENTS

EDITORIAL
THIRTY.

We have a good reason to celebrate again: this is the 30th time you are holding the ISSI Newsletter in your hands. In the course of publishing these 30 issues we had 85 contributors (editors and articles with no authorship (e.g. news, CFPs) not included) from 23 countries all over the world. Our valued authors piled up more than 1.5 million characters in about 234,000 words. This is some 10% longer than Fyodor Dostoyevsky's Crime and Punishment, which sounds nice until you put it in another context: J.K. Rowling wrote about 4,5 times more in her famous heptalogy alone – so dear authors: the competition is on! And as for the content: the attached Wordle figure (don't hesitate to zoom in!) tells everything. Although Wordle's analysis is far not scientific, it still clearly shows our favourite topics. Another text mining application confirmed that – after excluding the obvious stop words – the term *research* is our authors' most frequently used character combination put together out of those 1.5 million chars. One could read it no less than 1214 times (equivalent of 2.7 full A4 pages!) – 40 times per issues or 2.34 times per pages on average. It was followed by *issi*, *science* and *scientometrics* (1201, 1167 and 1028 occurrences, respectively). In order to find all the 1214 occurrences of *research*, readers had to download 105 megabytes in total during the past 7.5 years. The vast majority of this download size is consisted of 664 hi-res images: 417 photos, 140 charts, 20 cartoons and 87 other illustrations. What could we add to this? Thanks folks! Keep up with the good work and keep reading us!

Balázs Schlemmer, technical editor

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international society for scientometrics and informetrics

METRICS 2012

WORKSHOP ON INFORMETRIC AND SCIENTOMETRIC RESEARCH

OCTOBER 2012, BALTIMORE

CALL FOR ABSTRACTS

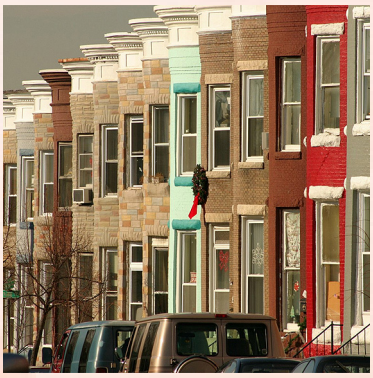

Photo courtesy of Hank Mitchell | BaltoPhoto.org

The ASIS&T Special Interest Group for Metrics (SIG/MET) will host a workshop preceding the ASIS&T Annual Meeting in Baltimore. This workshop will provide an opportunity for presentations and in-depth conversations on metric-related issues, including the latest theories, approaches, applications, innovations, and tools. Submissions in any area of metrics research will be accepted for review. The workshop is envisioned as a combination of short presentations and open workshop.

SIG/MET is the Special Interest Group for the measurement of information production and use. It encourages the development and networking of all those interested in the measurement of information. It encompasses not only bibliometrics, scientometrics and informetrics, but also measurement of the Web and the Internet, applications running on these platforms, and metrics related to network analysis, visualization, scholarly communication and the design and operation of Information Retrieval Systems.

SUBMISSIONS

Submissions should be in the form of two-page extended abstracts or position papers. A structured abstract is preferred, but not required. Two types of submissions will be accepted: posters and presentations. Please indicate the type of submission in bold at the beginning of your submission. The requirements for both formats are the same.

PEER-REVIEW PROCESS

Each submission will be reviewed and brief feedback given in narrative format.

DEADLINE & MORE INFO

Submissions are due July 30th.
More information on the workshop will appear soon on SIGMET website:
http://www.asis.org/SIG/SIGMET/

CoLIS 8

19-22 AUGUST, 2013 | COPENHAGEN, DENMARK

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The eight International Conference on Conceptions of Library and Information Science will take place at the Royal School of Library and Information Science in Copenhagen (Denmark), August, 19-22, 2013.

IMPORTANT DATES

1/3 2013: deadline for submission of papers
15/4 2013: editorial board receives papers back from referees
1/5 2013: authors receive message about whether their papers have been accepted or not - as well as suggestions for improvements
15/6 2013: authors have to submit final manuscripts in a form that can be copied for the conference.

THEME OF THE CONFERENCE

The theme of the conference is – as indicated in the name CoLIS – Conceptions (approaches, theories, etc.) of Library and Information Science (LIS). This includes: knowledge organization, library studies, information architecture; information behavior, interactive information retrieval; information systems; scholarly communication, digital literacy, bibliometrics – scientometrics – informetrics, interaction design and user experience

The organizers are especially interested in papers discussing theoretical aspects of LIS, such as philosophy of information and language, social media and user generated innovation, diversity issues.

SUBMISSIONS

All submissions should be in English - the official language of the conference.

All accepted papers will be published in the journal Information Research.

Types of submissions: research papers, short papers (research in progress), posters.

For more information see
http://www.iva.dk/english/colis8/

SCIENTOMETRICS2012

INTERNATIONAL CONFERENCE AND TRADE FAIR

UNIVERSITY LIBRARY OF REGENSBURG, GERMANY
SEPTEMBER 18 - 20, 2012

Universität Regensburg
UNIVERSITÄTSBIBLIOTHEK

BIBLIOMETRIE
SCIENTOMETRICS

BIBLIOMETRIC STANDARDS IN THE SCIENCES, SOCIAL SCIENCES AND HUMANITIES: CURRENT STATE AND FUTURE TRENDS

Measuring science qualitatively and quantitatively is anything but trivial. It is possible to quantitatively gather research output (i.e. publications and their perception), however, bibliometric procedures cannot arbitrarily be applied to the respective fields of expertise as both the publication process and management process of these proceedings differ immensely depending on the field.

Within the scope of this conference, the recent developments in bibliometric procedures in particular areas of research are to be discussed. The main focus will be on the opportunity to determine scientific publications in the humanities and their reception in research. This innovative field of activity will be compared to the "state of the art"-methods in the natural sciences as well.

The conference is addressed to bibliometricians, librarians, scientists from all fields, information providers and decision makers in science and research.

The presentations and conference workshops will be held in both German & English.

PLENARY LECTURES ARE PLANNED ON THE FOLLOWING TOPICS:

A RANKING OF JOURNALS IN BUSINESS SCIENCES

In Business Sciences there are different rankings for economic journals. Individual rankings and their fields of application will be presented and discussed through the use of concrete examples.

BIBLIOMETRIC PROCEDURES FOR THE ACQUISITION OF MONOGRAPHS

In many scientific disciplines the book, or monographs in general, play a prominent role. This form of publication is often not sufficiently considered in bibliometric analyses. This presentation block will focus on new possibilities of integrating monographs into bibliometric proceedings, e.g. with the help of catalog data.

INNOVATIVE BIBLIOMETRIC PROCEDURES IN THE FIELD OF STM

In the medical and scientific fields, bibliometric proceedings are already being applied and are also partly being used for evaluation purposes. The current bibliometric standard analyses and their potential areas of application will be presented here as well as innovative methods, which optimally describe the current research.

WORKSHOPS

In addition to the plenary lectures parallel workshops are going to take place. In these workshops, specific questions can be addressed and discussed in more detail in small groups.

EXECUTION OF BIBLIOMETRIC ANALYSES

Bibliometric analyses will be presented and carried out through the use of concrete examples. The main point of interest here is the practical implementation; thus, problems and pitfalls in bibliometric research will be pointed out.

SOCIAL PROGRAM

RECEPTION IN THE GOTHIC IMPERIAL CHAMBER

The town of Regensburg welcomes all visitors of Scientometrics2012 in the Gothic Imperial Chamber located in the Old Town Hall of Regensburg. This important medieval chamber shows magnificent mural painting of the 16th century as well as the imperial throne.

CONFERENCE DINNER AT THE RESTAURANT FÜRSTLICHES BRAUHAUS

All visitors of Scientometrics2012 are invited to take part in our conference dinner held on the exceptional premises of the Fürstliche Brauhaus in Regensburg. The cost of the conference menu will be included in the conference fee. Drinks will be billed separately.

GUIDED ART TRAIL TOUR

At the University Campus Regensburg you can walk across half a century of architectural history. See modern architecture and art embedded in landscaped nature by following our art trail.

GUIDED TOUR THROUGH THE BOTANICAL GARDEN OF REGENSBURG UNIVERSITY

Come and watch more than 5.500 plant species from all over the world in our large Botanical Garden. Plants usually growing in various climate zones and different continents are inviting you for a relaxing walk.

INFORMATION AND REGISTRATION

Web: www.bibliometrie2012.de
Host: Universitätsbibliothek Regensburg
Universitätsstr. 31
93053 Regensburg
Germany
bibliometrie[at]bibliothek.uni-regensburg.de

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TWO NORDIC BIBLIOMETRIC SEMINARS IN HELSINKI

17th NORDIC WORKSHOP ON BIBLIOMETRICS AND RESEARCH POLICY

CALL FOR PAPER

WORKSHOP ON BIBLIOMETRICS FOR THE SOCIAL SCIENCES AND HUMANITIES

ANNOUNCEMENT

Bibliometric researchers in the Nordic countries have arranged annual Nordic workshops on bibliometrics since 1996. The general idea of the workshop is to present recent bibliometric research in the Nordic countries and to create better linkages between bibliometric research groups and their PhD students.

The workshop language is English and the workshop is open to participants from any nation. The workshop is also open to participants who wish to take part without presenting. There are no fees for participating in the Nordic workshops on bibliometrics. However, travel, accommodation and meals have to be financed by the participants themselves.

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17th NORDIC WORKSHOP ON BIBLIOMETRICS AND RESEARCH POLICY

The 17th Nordic Workshop on Bibliometrics and Research Policy is organized by Helsinki University Library on 11-12 October.

Program and details concerning conference venue, travel and accommodation will be announced on the Workshop's website: http://blogs.helsinki.fi/nbw-2012/

CALL FOR PAPERS

The participants who wish to present a research paper or a research idea are called for a max 200 word abstract of their presentation. The workshop is also open to participants without a presentation.

Abstracts are asked to be submitted by e-mail as a pdf-file to Maria Forsman [maria.forsman [at] helsinki.fi]

DEADLINE OF SUBMISSION

Deadline for submission of abstracts is on 24 August 2012.

The authors will be notified of acceptance by 10 September 2012.

Further questions can be addressed to the workshop coordinators:

- Maria Forsman
  maria.forsman [at] Helsinki.fi
- Eva Isaksson
  eva.isaksson [at] Helsinki.fi
- Mari Elisa Kuusniemi
  mari.elisa.kuusniemi [at] Helsinki.fi

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WORKSHOP ON BIBLIOMETRICS FOR THE SOCIAL SCIENCES AND HUMANITIES

This year the Nordic Workshop will be held jointly with The Workshop on Bibliometrics for the Social Sciences and Humanities on 10-11 October organized by NordForsk. See more information: http://blogs.helsinki.fi/nordforskssh2012/

The keynote speaker of both workshops is professor Diana Hicks from the School of Public Policy, Georgia Tech, U.S.

Maria Forsman
DSocSc, Helsinki University Library

A NEW MEASURE OF GLOBALIZATION

THE CO-CITATION TRIANGLE PERIMETER (CTP)

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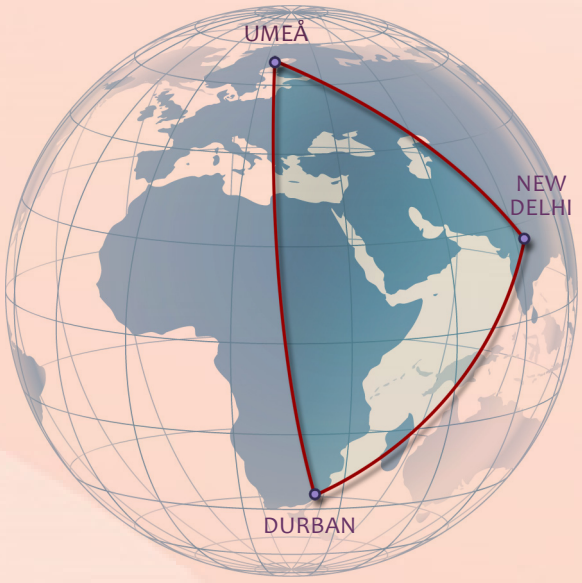
A co-citation might be looked upon as a triangle connecting the locations of one citing paper and the locations of two co-cited papers. The perimeter of such a co-citation triangle (CTP), which is the sum of the distances between three locations, could be used as an indicator of globalization.

For example, if a paper from Paris cites one paper from Los Angeles and another from Sydney that would be a much more globalized co-citation compared to if one paper from Leuven cites one from Budapest and another from Amsterdam. Obviously, the sum of distances in the first triangle is several times much longer than for the second co-citation.

If we apply this measure to citations among papers in the journal Scientometrics we can see that the mean CTP was high for the first five years, significantly shorter up to year 2000, and then peaked during the years 2001-2005 (Table 1). The strong growth of papers from Asia, especially India and China, is probably the reason behind the increasing distances.



CITING PERIOD	MEAN CTP
1986-1990	10828
1991-1995	13000
1996-2000	11760
2001-2005	16816
2006-2010	16284

Table 1. Mean Co-citation Perimeter (CTP) in papers from Scientometrics

If we have a look at the most frequently citing cities, making the co-citations, we find that Canberra has the longest CTP-value followed by Durban and Tokyo and Taipei (Table 2). A great number of co-citations come from New Delhi with mean CTP above 20.000 kilometers. The European countries have all much shorter CTP. Cities in the European periphery, like Wolverhampton and Umea, have higher CPT values compared to cities in central Europe.

The major explanation for this pattern is that European cities have been active longer in the field and therefore attract more citations. They are also more influential and it is not surprising that they themselves cite on shorter distances compared to late comers and non-European cities.

Waltman, Tijssen, & van Eck (2011) found that the average collaboration distance per publication has increased considerably from 1980 to 2009. Citation distances are less studied, but these observations suggest that they are generally longer and vary strongly depending on which location is making the citations.

REFERENCE

Waltman, L., Tijssen, R. J. W., & van Eck, N. J. (2011). Globalisation of science in kilometres. Journal of Informetrics, 5(4), 574-582

CITING CITY	NUMBER OF CO-CITATIONS	MEAN CTP
Canberra, Australia	382	36232
Durban, South Africa	359	26326
Tokyo, Japan	440	24188
Taipei, Taiwan	357	22652
Chiba, Japan	378	22180
Beijing, China	2083	21788
New Delhi, India	13343	20837
Shanghai, China	629	20631
Wolverhampton, England	443	18255
Cluj Napoca, Romania	861	17066
Umea, Sweden	348	15633
Granada, Spain	865	13903
Brighton, England	780	13291
Amsterdam, Netherlands	1406	13013
Leuven, Belgium	2601	13002
Madrid, Spain	1484	12702
Budapest, Hungary	4661	12577
Paris, France	1196	12089
Zagreb, Croatia	1212	11829
Bonn, Germany	347	11764
Berlin, Germany	349	10101
Lyngby, Denmark	364	9697
Bern, Switzerland	367	9464
Leiden, Netherlands	1392	9106
Nantes, France	755	7987

Table 2. Mean Co-citation Perimeter (CTP) by citing city in papers from Scientometrics

H-INCONSISTENCY IS NOT AN ISSUE IN DYNAMICAL SYSTEMS

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Abstract: By introducing the definition of h-inconsistency, the author points out that the h-inconsistency discussed in the recent literature is not an issue in real dynamical h-index systems, because the h-index is only affected by highly cited publications and that any publication becomes a highly cited one needs time.
Keywords: Inconsistency; h-index; dynamical h-index

INTRODUCTION

Recently, some scholars pointed out that the h-index is inconsistent (Bouyssou and Marchant, 2011; Waltman and van Eck, 2011). They claim that, as the h-index is not a consistent indicator we cannot apply it to compare persons or groups. However, they ignore an important factor, namely time (t). When we consider h-index in a dynamical system (Egghe, 2007), *h-inconsistency (because the word "consistency" has different meanings in different discipline or even different areas of a same discipline, we call above inconsistency of h-index as h-inconsistency and give definition in next section) is not an issue.*

H-INDEX SYSTEM

At first, let's define h-inconsistency: Suppose two scientists or scientific groups F and G, ranked on their h-index h as h(F) > h(G). If they cooperated publications with introducing h increment Δ and h(F+Δ) < h(G+Δ) is produced, we call this reverse ranking as h-inconsistency.

According to the original definition of the h-index (Hirsch, 2005) and further analysis (Rousseau, 2006; Rousseau and Ye, 2008; Ye, 2009, 2011) the h-index (h) divides the publication-citation (C-P) curve into two parts: the h-core (hc) and h-tail (ht), as shown in Fig.1.

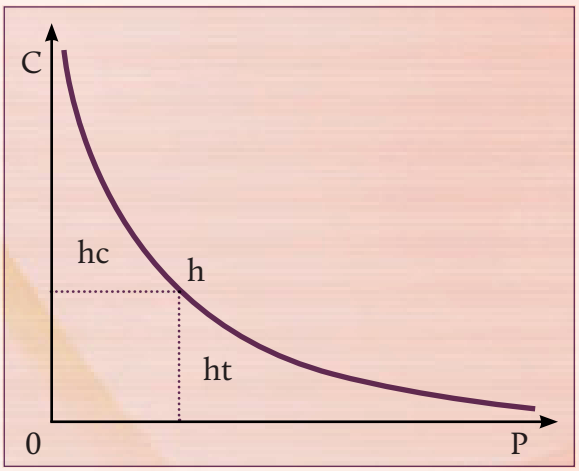

Fig. 1 The h-index leads to a division in h-core and h-tail

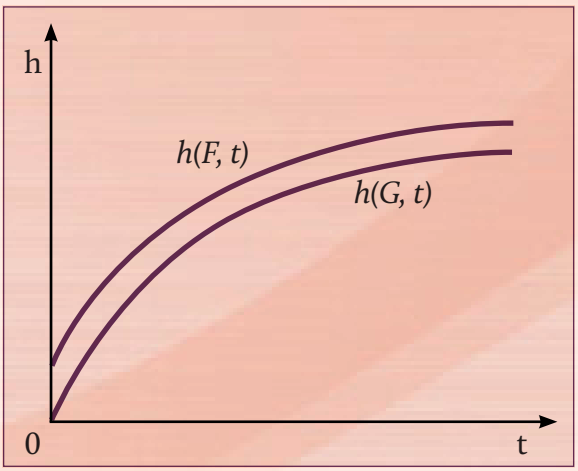

Fig. 3 Dynamical or evolutional h-curves: h(F, t) > h(G, t)

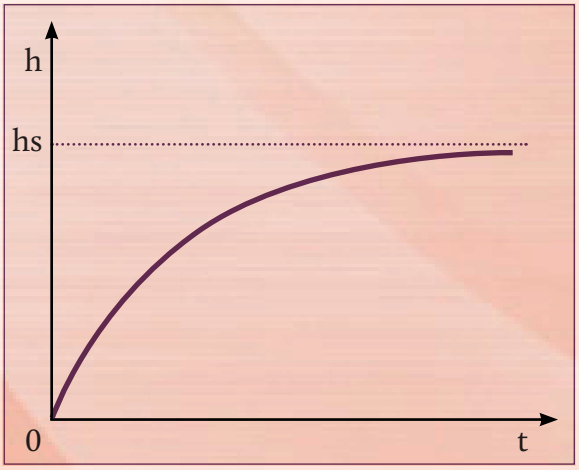

Fig. 2 Dynamical or evolutional h-index

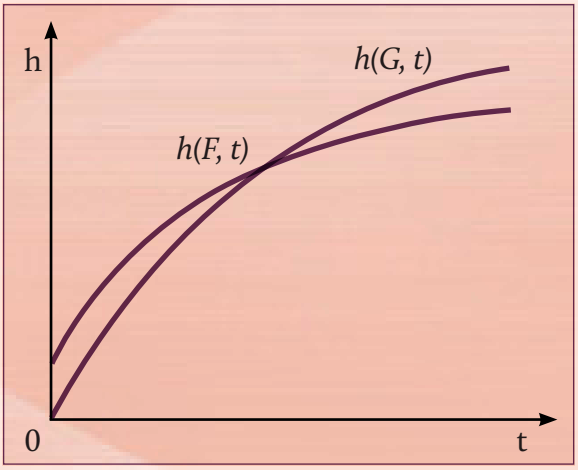

Fig. 4 Dyn. or evolutional h-curves leading to h(F, t) < h(G, t)

Clearly only highly cited publications can affect the h-index. However, it needs time before a new publication becomes a highly cited publication, so that no new publication can belong to the h-core and affect the h-index in most cases. All new publications just add citations to the h-tail (a possible exception being a new scholar with a very low h-index).

Consider two scientists (or groups of scientists) F and G, ranked based on their h-index h. If F is better than G according to the h-index then h(F) > h(G). When they cooperate to publish N extra articles, each one being cited one time instantly and h(F) > h(G) > 1, these cooperative articles never change the mutual ranking of F and G. If the cooperative articles bring an increment Δ to the h-tail and if we denote (symbolically) the new situations by F+Δ and G+Δ, we always have h(F+Δ) > h(G+Δ). Hence, it is impossible to go from h(F) > h(G) to h(F+Δ) < h(G+Δ), particularly when Δ occurs in one instant. Such a reverse ranking can only happen after a considerable amount of time, when the new articles have accrued more citations. This has nothing to do with the issue of h-inconsistency.

In Lotkanian informetrics (Egghe, 2005), the dynamical h-index is obtained as

$$h = ((1-a^t)^{\alpha-1})T^{1/\alpha} \qquad (1)$$

where a is the aging rate, α is the exponent of Lotka's law of the system, and T is the total number of articles in the defined group. For $t \to \infty$ this leads to the steady state (static) formula $h_s = T^{1/\alpha}$ (Rousseau and Egghe, 2006).

The dynamical h-index formula provides the basic pattern for the evolution of the h-index as shown in Fig.2. Although the formula is based on Lotkaian informetrics, the curve is a useful reference for consideration, as all theoretical formulae of the h-index can be unified when Heaps' or Herdan's law is valid (Ye, 2011).

From Fig.2 we also see that the h-index gradually increases from low to high. In dy-

namical h-index systems, no publication can instantly become a highly cited one, which implies that h-inconsistency cannot occur.

EVOLUTIONAL H-CURVES

Consider two scientists (or groups of scientists) F and G. Their h-indices at time t are denoted as h(F, t) and h(G, t). Assume that

$$h(F, 0) > h(G, 0) \quad (2)$$

After time t it is possible that

$$h(F, t) > h(G, t) \quad (3)$$

This situation is shown in Fig. 3.
If there exists a time t such that

$$h(F, t) \leq h(G, t) \quad (4)$$

then this is the result of a dynamical development as shown in Fig. 4.

If the first situation (3) occurs, this is normal development. If the second situation occurs (4), this means that G develops quicker than F. As this development may take a long time, we can't say it is due to h-inconsistency.

All the cases studied in the literature assume a special time window, which means static situations. When time increases situations will change, so that all changes belong to dynamic cases. If we consider a static time window, we always see fixed h-indices. So the comparison of h-indices always happens in a fixed time window. When time changes, anything can happen.

CONCLUSION

In the articles discussing the h-inconsistency, only the static h-index was considered. *In real dynamical h-index systems, h-inconsistency discussed in the literature cannot happen, because the h-index is only affected by highly cited publications and that any publication becomes a highly cited one needs time. Given that changes are natural, results obtained through normal development have nothing to do with h-inconsistency.*

ACKNOWLEDGEMENTS

The author acknowledges the National Natural Science Foundation of China grants (NSFC No.7101017006 and 71173187) for financial support and Prof. Ronald Rousseau's helpful comments, as well as anonymous reviewer's comments.

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Ye, F. Y., & Rousseau, R. (2010). Probing the h-core: An investigation of the tail-core ratio for rank distributions. Scientometrics, 84: 431-439.

Ye, F. Y. (2009). An investigation on mathematical models of the h-index. Scientometrics, 81(2): 493-498.

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INTO THE FUTURE

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Abstract: We draw the attention of our colleagues to the Future Orientation Index recently proposed by Preis, Moat, Stanley and Bishop. In a somewhat similar vein we introduce the future-past ratio (F-P ratio) which tries to measure if a field is future-oriented or rather oriented towards the past. Surprisingly, Information and Library Sciences is the most future oriented subfield among those we studied. Yet, it seems that being future-oriented is not a means that lead to higher impact.
Keywords: temporal orientation of subfields, correlations, webmetrics

INTRODUCTION: THE FUTURE ORIENTATION INDEX

Recently Preis, Moat, Stanley and Bishop (2012) proposed the future orientation index. This new web-based index tries to measure to which extent countries' inhabitants are more interested in the future than in the past. They used Google logs to find out the number of queries for the next year and for the previous one. For example the value for 2010 refers to the number of searches for 2009 (past) and for 2011 (future) performed in the year 2010. The ratio of these two numbers is the Future Orientation Index (FOI). They investigated 45 countries. In most cases this index was smaller than one (for the year 2010). Switzerland had the highest future orientation index (1.429), followed by Australia (1.423), while Vietnam had the smallest one (0.227). Table 1 shows the FOI for the G-7 countries (left column) and for some upcoming countries (right column). Belgium had a FOI of 1.240 and the Netherlands a value of 1.187. The most interesting finding was the high correlation between FOI and GDP, with the USA a clear outlier. The authors suggest that, generally, being future-oriented and economic success go together.

G-7 COUNTRIES	FOI	UPCOMING COUNTRIES	FOI
UK	1.229	Brazil	1.076
Germany	1.178	Russia	0.605
France	1.155	India	0.597
Japan	1.115	China	0.501
Canada	1.032	S. Korea	0.643
USA	0.989		
Italy	0.977		

Table 1. FOI values (2010) for the G-7 countries and some upcoming countries

AN INFORMETRIC APPLICATION

This interesting article led us to the question if some scientific fields are more future oriented and some more inclined to the past. Surely one does not expect that such an ori-

entation has any meaning in the sciences. The past or the future do not seem valid points of view when considering physics, chemistry and mathematics. Yet, this might be different for the social sciences and humanities. Hence we performed a search in the WoS (social sciences and humanities) to find out which fields are most future oriented and which are least.

METHODS

On June 10, 2012 we performed a search in Thomson Reuters' Web of Science (WoS) restricting the used citation databases to the Social Sciences Citation Index (SSCI), the Arts & Humanities Citation Index (A&HCI) and the Conference Proceedings Citation Index - Social Science & Humanities (CPCI-SSH). We restricted the publication years to the period 1993-2012. A search was performed for the topic (TS=) "the past" (as a phrase) and one for the topic "the future" (as a phrase), using these searches as proxies for heaving a tendency towards the past or towards the future. We note that it makes no sense to use years as was done by Preis et al. (2012). Then articles dealing with both topics (past and future) were removed. Searches were done once using all document types and once using the article type only. Then the results for the past and for the future were analyzed based on so-called Web of Science Categories. For those categories with the most published publications, either on "the past" or on "the future" the ratio (number of future related publications) divided by (number of past related publications) was determined. This ratio will be called the F-P ratio (future-past ratio in full).

GLOBAL RESULTS

Table 2 shows the total number of publications that were retrieved. By "pure past" we mean articles that were retrieved using the topic search "the past" and were not retrieved with "the future". Similarly, "pure future" referred to publications retrieved with "the future" and not with "the past".

Clearly more publications deal with the past than with the future, and this is even more the case for "articles". Analyses in the next section refer only to "pure" publications.

"the past" all publications	49,634
"the past" only articles	38,852
"the future" all publications	43,239
"the future" only articles	28,440
"the past" AND "the future" all	3,284
"the past" AND "the future" articles	2,425
"pure past" all	46,350
"pure past" articles	36,427
"pure future" all	39,955
"pure future" articles	26,015

Table 2. General information on search results; Number of retrieved items

DETAILED RESULTS ON THE F-P RATIO OF SUBFIELDS

Let us first have a look at the detailed result, shown in Table 3. Does it have some face value? We think it does, as subfields such as history and archaeology have a low F-P ratio while international relations, planning and business related fields have a high F-P ratio.

Surprisingly, *Information Science and Library Science* has the highest F-P ratio. Even taking into account that this category includes many management journals this still indicates that the library and information sciences are rather future oriented (as *Management* itself is not in the top ten of this list).

Some elementary statistics: the lists for all publications and for articles only are highly correlated: their Pearson correlation coefficient is 0.96, while their Spearman rank-correlation coefficient is 0.98. Articles are less future oriented than all publications: the average F-P ratio for all publications is 0.95 (s.d. = 0.42) while the average F-P ratio for articles is 0.78 (s.d. 0.34). This difference is highly significant.

Some other observations: *Family studies* and *Women's studies* are much more oriented to the past than we would have expected. *Environmental studies* and *sciences* are clearly future-oriented, but (surprisingly?) *Religion* and *Philosophy* also are. *Communication* and *Urban Studies* are among the most (time) neutral subfields.

RELATIONS WITH OTHER INDICATORS

The FOI turned out to be related to the GDP (and economic success?) of nations. Is a high or low F-P ratio related to some form of scientific success? Unfortunately, we found only negative correlations (or no correlation). Indeed, Table 4 gives the F-P ratio (all publications) and the aggregate impact factor of the field in 2003 (the middle year of the period [1993, 2012]

RANK (ALL PUBL.)	WOS SUBFIELD	F-P RATIO ALL PUBLICATIONS	F-P RATIO ONLY ARTICLES	RANK (ONLY ARTICLES)
1	INFORMATION SCIENCE LIBRARY SCIENCE	1.966	1.549	1
2	SOCIAL ISSUES	1.765	1.208	5
3	INTERNATIONAL RELATIONS	1.598	1.178	6
4	PLANNING DEVELOPMENT	1.536	1.409	3
5	ENVIRONMENTAL SCIENCES	1.465	1.484	2
6	BUSINESS	1.435	1.152	7
7	ENVIRONMENTAL STUDIES	1.422	1.307	4
8	OPERATIONS RESEARCH MANAGEMENT SCI.	1.401	1.060	11
9	RELIGION	1.359	0.889	16
10	ECONOMICS	1.346	1.143	8
11	MANAGEMENT	1.303	0.999	14
12	LAW	1.288	1.135	9
13	BUSINESS FINANCE	1.266	1.000	13
14	HUMANITIES MULTIDISCIPLINARY	1.232	0.907	15
15	PHILOSOPHY	1.182	1.085	10
16	NURSING	1.174	1.017	12
17	POLITICAL SCIENCE	1.140	0.803	22
18	PUBLIC ADMINISTRATION	1.136	0.851	17
19	EDUCATION EDUCATIONAL RESEARCH	1.024	0.753	25
20	PSYCHOLOGY APPLIED	0.997	0.850	18
21	GERONTOLOGY	0.981	0.755	24
22	COMMUNICATION	0.980	0.823	21
23	URBAN STUDIES	0.954	0.830	20
24	ART	0.909	0.843	19
25	SOCIAL SCIENCES INTERDISCIPLINARY	0.874	0.698	27
26	GEOGRAPHY	0.855	0.760	23
27	REHABILITATION	0.811	0.723	26
28	SOCIOLOGY	0.805	0.618	32
29	SOCIAL WORK	0.785	0.674	28
30	HEALTH CARE SCIENCES SERVICES	0.774	0.671	29
31	LITERATURE	0.750	0.623	31
32	AREA STUDIES	0.743	0.582	33
33	PSYCHOLOGY	0.724	0.474	37
34	PSYCHOLOGY MULTIDISCIPLINARY	0.687	0.632	30
35	HEALTH POLICY SERVICES	0.677	0.550	35
36	SOCIAL SCIENCES BIOMEDICAL	0.638	0.557	34
37	PSYCHOLOGY DEVELOPMENTAL	0.536	0.510	36
38	WOMEN'S STUDIES	0.528	0.377	40
39	PUBLIC ENVIRONM. OCCUPATIONAL HEALTH	0.470	0.408	39
40	PSYCHOLOGY CLINICAL	0.458	0.433	38
41	PSYCHIATRY	0.430	0.367	41
42	FAMILY STUDIES	0.413	0.342	43
43	HISTORY	0.393	0.348	42
44	ANTHROPOLOGY	0.291	0.291	44
45	SUBSTANCE ABUSE	0.227	0.192	45
46	ARCHAEOLOGY	0.149	0.142	46

Table 3. F-P ratios for WoS Subfields

which we investigated) at least for those fields where this indicator is available in the JCR Social Sciences. The Pearson correlation coefficient between the F-P ratio over the period [1993-2012] and the aggregate impact factor (2003) = - 0.353 (p-value = 0.038 < 0.05) while the Spearman rank correlation coefficient between the F-P ratio and the median impact factor (2003) is – 0.181 (p-value = 0.3, meaning: no correlation). This would suggest that being future-oriented and having a high impact factor is at best non-correlated. Surely, this result requires further investigation and should remind us that correlations are not indicators of cause-effect relations.

WOS SUBJECT CATEGORIES	F-P RATIO	AGGREGATE IF
INFORMATION SCIENCE LIBRARY SCIENCE	1.966	0.673
SOCIAL ISSUES	1.765	0.646
INTERNATIONAL RELATIONS	1.598	0.668
PLANNING DEVELOPMENT	1.536	0.696
BUSINESS	1.435	0.862
ENVIRONMENTAL STUDIES	1.422	0.828
ECONOMICS	1.346	0.761
MANAGEMENT	1.303	1.012
LAW	1.288	1.366
BUSINESS FINANCE	1.266	0.614
NURSING	1.174	0.713
POLITICAL SCIENCE	1.140	0.525
PUBLIC ADMINISTRATION	1.136	0.483
EDUCATION EDUCATIONAL RESEARCH	1.024	0.493
PSYCHOLOGY APPLIED	0.997	0.988
GERONTOLOGY	0.981	1.924
COMMUNICATION	0.980	0.641
URBAN STUDIES	0.954	0.741
SOCIAL SCIENCES INTERDISCIPLINARY	0.874	0.535
GEOGRAPHY	0.855	1.231
REHABILITATION	0.811	0.773
SOCIOLOGY	0.805	0.601
SOCIAL WORK	0.785	0.536
AREA STUDIES	0.743	0.374
PSYCHOLOGY MULTIDISCIPLINARY	0.687	1.229
HEALTH POLICY SERVICES	0.677	1.523
SOCIAL SCIENCES BIOMEDICAL	0.638	1.219
PSYCHOLOGY DEVELOPMENTAL	0.536	1.694
WOMEN S STUDIES	0.528	0.598
PUBLIC ENVIRONMENTAL OCCUPATIONAL HEALTH	0.470	1.367
PSYCHOLOGY CLINICAL	0.458	1.568
PSYCHIATRY	0.430	2.542
FAMILY STUDIES	0.413	0.827
HISTORY	0.393	0.333
ANTHROPOLOGY	0.291	0.739
SUBSTANCE ABUSE	0.227	1.503

Table 4. F-P ratios and aggregate IFs for social sciences subject categories

CONCLUSION

We drew the attention of our colleagues to the Future Orientation Index as introduced by Preis et al. In a somewhat similar vein we introduced the future-past ratio (F-P ratio) proposing an indicator to measure if a field is future-oriented or rather oriented towards the past. According to this indicator the field of *Information and Library Sciences* is the most future oriented subfield in the social sciences and humanities. This agrees with the observation made by Halevi and Moed (2012) that library science research inspired developments of information retrieval solutions, sometimes years before the technology was available. Yet, it seems that there is no positive relation between being future-oriented and having a high short-term impact.

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IS SCIENTOMETRICS A 'METRICS' INDEED?

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Abstract: In this paper the authors seek to answer the question of whether the field of scientometrics/bibliometrics shares essential characteristics of 'metrics' sciences. In order to achieve this objective, the citation network of seven selected metrics and their information environment is analysed.

INTRODUCTION

Whenever a discipline reaches a stage that requires the support of statistical methods, a *metrics* emerges from this discipline. Typical examples are biometrics (nowadays rather referred to as biostatistics), econometrics and scientometrics (including informetrics) as a subfield of information science. One should assume that all these metrics fields heavily rely on those fields they emerged from and on mathematical statistics and share those methods implying by and large close relationship. The objective of this study is to analyse if our field behaves like the other metrics and which of those are closest to scientometrics.

DATA

Only 'citable papers' (article, note, letter, review and proceeding papers), which are indexed in the 1996-2010 annual volumes of Thomson Reuters' Web of Science (WoS) have been taken into account. Cited papers indexed in the Web of Science (1991-2010) and citing papers by the metrics journal papers (1996-2010) in a ten-year window are analysed.

METHODS AND RESULTS

Journals indexed in the Web of Science with titles containing the term [metric*] or

[metrik*] have been selected and grouped into the following seven categories. Biometrics (1), chemometrics (2), econometrics (3), environmetrics (4), psychometrics (5), scientometrics & informetrics (6) and technometrics (7). Note that the latter discipline is focused on statistical methods in the physical, chemical and engineering sciences, and does not cover the technology-related part of bibliometrics.

Citation flow within and among these groups has been analysed. Furthermore, the relationship based on symmetrised cross-citation links using cosine similarities have been studied following the methods published by Zhang et al. (2009). Self-citation within the same group has been removed.

Finally, references and citations in the individual articles published in the metrics journals were assigned to ISI Subject Categories. Of course, only WoS-indexed references/citations could be taken into account. Group self-references and self-citations, respectively, ranged between about 50% in environmetrics and 99% in scientometrics. Therefore, these self-citations were excluded to avoid biases in measuring information flow and relationship.

First we looked at the cross-citation links among the groups. The network visualisation presented in Figure 1 is based on Pajek (Batagelj and Mrvar, 2002). The size of the circles is proportional to the number of papers assigned to the individual groups. The thickness of lines connecting the groups is proportional to the strength of the links. The results have struck us somewhat unexpectedly. The relative closeness of environmetrics to biometrics and technometrics to chemometrics, respectively seems to be plausible. However, we found the strong links between econometrics and biometrics as well as the relative isolation of scientometrics rather surprising.

At this point it seemed to be logical and necessary, as a second step, to have a closer look at the direct references and citations among these groups. The results are shown in Figure 2. Fields' labels denote biometrics, chemometrics, econometrics, environmetrics, psychometrics, scientometrics & informetrics and technometrics, respectively. The main diagonal is empty since self-cita-

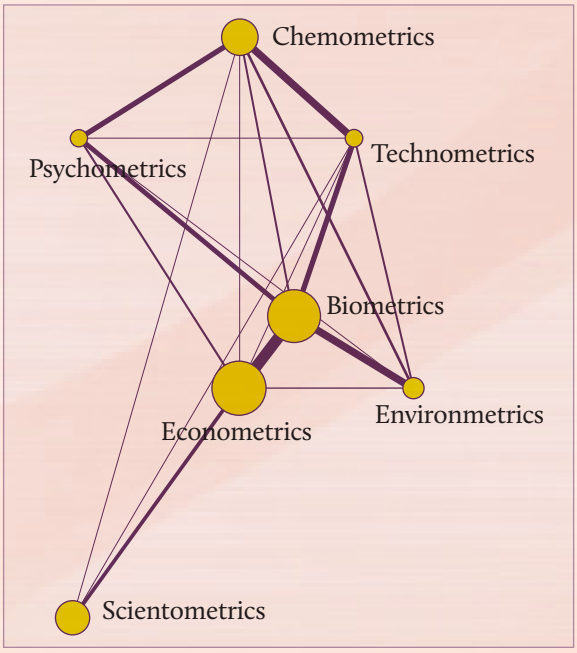

Figure 1: Cross-citation links between the metrics groups (visualisation by Pajek with Kamada–Kawai layout + manual postprocessing) [Data sourced from Thomson Reuters Web of Knowledge]

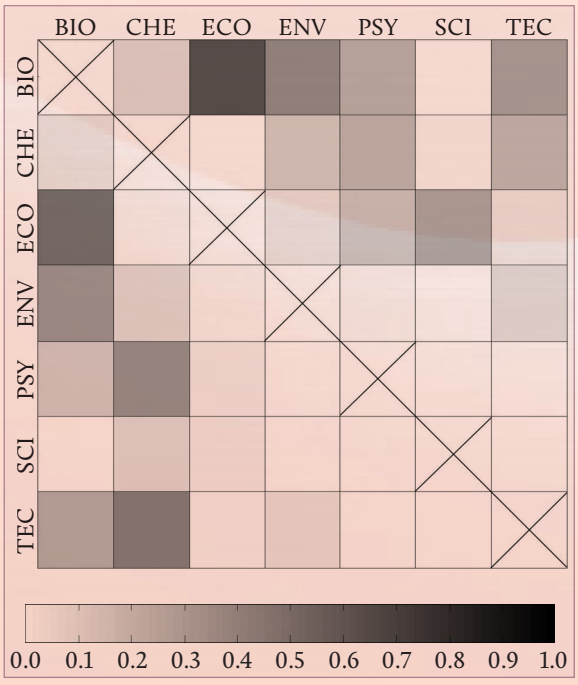

Figure 2: Strength of references and citations among the metrics groups (citing groups on the horizontal, cited groups on the vertical axis) [Data sourced from Thomson Reuters Web of Knowledge]

tions and -references were excluded. Some of the links proved to be symmetric. This applies to the rather strong link between econometrics and biometrics but also to the somewhat weaker ones, for instance, between biometrics and environmetrics, biometrics and technometrics, and econometrics and psychometrics. The link between scientometrics and econometrics is obviously unirectional. Also the asymmetry in the relationship between chemometrics and technometrics is worth mentioning.

Table 1 shows the most important information sources outside each metrics group on the basis of ISI Subject Categories. Since journal assignment to these disciplines is not unique, figures cannot be summed up to the total. Subject categories are ranked in descending order by their share in the references in each group. Also here we find some interesting results. Metrics fields are expected to cite besides their "mother field" and closely related fields also mathematical subdisciplines, notably statistics and probability. While groups 1–5 and 7 by and large follow this pattern, scientometrics relies besides its "mother field" (information science) rather upon computer science and multidisciplinary journals. Above all, biometrics and technometrics relied largely on statistics & probability. Besides scientometrics, which is hardly rooted in mathematical subdisciplines, also chemometrics has relatively less background of mathematics or statistics. Computer science, instead of mathematical methodology, plays a more important role in the latter two metrics.

Due to the interdisciplinarity of these disciplines, most of the metrics journals have multiple assignments to different

METRICS	ISI FIELD (CITED)	% OF REFS.
Biometrics	Statistics & Probability	61.6%
Biometrics	Public, Environmental & Occupational Health	15.5%
Biometrics	Medical Informatics	11.5%
Biometrics	Medicine, Research & Experimental	11.2%
Biometrics	Genetics & Heredity	6.6%
Chemometrics	Chemistry, Analytical	31.2%
Chemometrics	Computer Science, Interdisciplinary Applications	8.1%
Chemometrics	Biochemical Research Methods	7.1%
Chemometrics	Statistics & Probability	6.9%
Chemometrics	Engineering, Chemical	6.3%
Econometrics	Economics	57.1%
Econometrics	Statistics & Probability	30.1%
Econometrics	Social Sciences, Mathematical Methods	15.1%
Econometrics	Business, Finance	13.6%
Econometrics	Mathematics, Interdisciplinary Applications	2.4%
Environmetrics	Statistics & Probability	39.1%
Environmetrics	Environmental Sciences	17.6%
Environmetrics	Meteorology & Atmospheric Sciences	10.4%
Environmetrics	Public, Environmental & Occupational Health	9.8%
Environmetrics	Ecology	5.7%
Psychometrics	Statistics & Probability	41.1%
Psychometrics	Psychology, Mathematical	24.7%
Psychometrics	Social Sciences, Mathematical Methods	23.9%
Psychometrics	Mathematics, Interdisciplinary Applications	18.8%
Psychometrics	Psychology, Experimental	13.0%
Scientometrics	Information Science & Library Science	31.8%
Scientometrics	Computer Science, Information Systems	22.6%
Scientometrics	Multidisciplinary Sciences	13.4%
Scientometrics	Management	12.7%
Scientometrics	Planning & Development	9.8%
Technometrics	Statistics & Probability	63.1%
Technometrics	Operations Research & Management Science	14.2%
Technometrics	Engineering, Industrial	12.5%
Technometrics	Engineering, Electrical & Electronic	6.3%
Technometrics	Mathematics, Interdisciplinary Applications	4.1%

Table 1. Top 5 ISI subject categories as information "sources" for metrics journal groups

WoS subject categories. For instance, the two journals in chemometrics, *Journal of Chemometrics* and *Chemometrics and Intelligent Laboratory Systems*, are assigned to six subject categories each, namely, to automation & control systems; chemistry, analytical; computer science, artificial intelligence; instruments & instrumentation; mathematics, interdisciplinary applications; statistics & probability. The question arises, then, of whether the subject assignments is properly reflected by the subject assignment of the source literature of these metrics journals. Using biometrics as an example, the subject assignments of the corresponding journals in the Web of Science are biology, mathematical & computational biology, and statistics & probability, respectively. However, after excluding the group self-citations, we do not find biology or mathematical & computational biology in the source literature, and instead, public, environmental & occupational health, medical informatics and some other medical related disciplines appear as the most important information sources besides statistics & probability. As to chemometrics, we found besides the disciplines chemistry, analytical and statistics & probability also computer science, interdisciplinary applications; biochemical research methods and engineering, chemical that seems to be more relevant information sources than those subject categories (automation & control systems and instruments & instrumentation) to which the chemometrics journals were assigned. The observed deviations of the source literature from the actual subject assignment might

METRICS	ISI FIELD (CITING)	% OF CIT.
Biometrics	Statistics & Probability	53.3%
Biometrics	Public, Environmental & Occupational Health	13.6%
Biometrics	Medical Informatics	11.0%
Biometrics	Mathematical & Computational Biology	10.7%
Biometrics	Medicine, Research & Experimental	10.1%
Chemometrics	Chemistry, Analytical	38.6%
Chemometrics	Biochemical Research Methods	9.0%
Chemometrics	Chemistry, Multidisciplinary	8.6%
Chemometrics	Spectroscopy	8.3%
Chemometrics	Engineering, Chemical	7.6%
Econometrics	Economics	61.9%
Econometrics	Statistics & Probability	18.1%
Econometrics	Business, Finance	10.6%
Econometrics	Social Sciences, Mathematical Methods	10.2%
Econometrics	Mathematics, Interdisciplinary Applications	4.3%
Environmetrics	Environmental Sciences	27.0%
Environmetrics	Statistics & Probability	25.8%
Environmetrics	Ecology	10.2%
Environmetrics	Public, Environmental & Occupational Health	8.8%
Environmetrics	Meteorology & Atmospheric Sciences	7.9%
Psychometrics	Statistics & Probability	27.7%
Psychometrics	Psychology, Mathematical	25.5%
Psychometrics	Mathematics, Interdisciplinary Applications	22.5%
Psychometrics	Social Sciences, Mathematical Methods	22.2%
Psychometrics	Psychology, Experimental	13.2%
Scientometrics	Information Science & Library Science	47.8%
Scientometrics	Computer Science, Information Systems	30.5%
Scientometrics	Management	6.4%
Scientometrics	Planning & Development	4.6%
Scientometrics	Multidisciplinary Sciences	2.8%
Technometrics	Statistics & Probability	54.3%
Technometrics	Operations Research & Management Science	21.7%
Technometrics	Engineering, Industrial	17.9%
Technometrics	Computer Science, Interdisciplinary Applications	8.7%
Technometrics	Engineering, Multidisciplinary	5.3%

Table 2. Top 5 ISI subject categories as information "targets" for metrics journal groups

also reflect some trends in the research profiles of the corresponding metrics.

In a third step, a similar analysis was applied to the metrics groups again, however, this time to the opposite direction of citation flow. In this step we were interested to learn how knowledge from these metrics was diffused to other subjects. Table 4 presents the top five subject categories citing the metrics journal groups, where, as before, the group self-citations were ignored. Statistics & probability, appears not only the main information source for most metrics, but also one of the most important disciplines to which the knowledge was transferred. Just like the case in information sources, we found one exceptional case, namely scientometrics, that had hardly any close relationship with statistics & probability as reflected by citations of either direction. Biometrics, again, has closer relationship with public, environmental & occupational health, medical informatics and other medical related disciplines. Most users of bibliometric studies and indicators are apparently active researchers in the life sciences. The direct comparison of information "sources" and "targets" and their asymmetries provides further instructive information. For instance, computer science was found to be an important information source for chemometrics, while on the other side of knowledge diffusion, spectroscopy appeared as one of the most related subjects.

CONCLUSIONS

A similarity of cognitive patterns was found in most of the studied metrics fields. Of course, multiple assignment of cited journals in closely related fields might here distort the picture and result in biases. A closer look at cited journals, however, reveal that journals in mathematical statistics (e.g., *Journal of the American Statistical Association* and *Annals of Statistics*) are among the most cited journals. Only scientometrics deviated from these patterns by being relatively isolated in the cross-citation network and by somewhat neglecting mathematics a methodological source. Instead of sourcing in mathematical statistics, some multidisciplinary journals including *Nature*, *Science*, *Proceedings of the National Academy of Sciences of the United States of America* serve as important information sources for scientometrics. Within the metrics journal groups, the only noticeable link that scientometric has established with another 'metric' is with econometrics.

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