Citation metrics across disciplines

Google Scholar, Scopus and the Web of Science:
A cross-disciplinary comparison

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Presentation outline

1. Brief introduction of my background

2. Audit culture in academia and the "danger" of peer review

3. Introduction of our bibliometric study of 146 senior academics across five disciplines

4. Citation metrics across disciplines and data-sources with a focus on Social Sciences and Humanities

5. Conclusions and further reading

Quick Intro: Anne-Wil Harzing

- My name?...., Yes Anne-Wil is one name and not part of my family name

- Started at Middlesex in July 2014
  - 2001-2014: Melbourne (PhD director 2004-2009, Associate Dean RHD, 2009-2010, Associate Dean Research, 2010-2013)
  - 1991-2001: Bradford (UK), Maastricht, Tilburg & Heerlen (Netherlands)

- Productive and passionate researcher & research mentor
  - 79 international journal articles since 1995 (160+ publications in total)
  - >12,000 Google Scholar citations, h-index 51, ISI citations: >4,000, top 1% most cited world-wide in Economics & Business

- Service to the academic community
  - Editorial board membership of a dozen journals
  - Personal website since 1999, 1000-1500 visitors/day, many free resources
    - Journal Quality List since 2000, 58th edition
    - **Publish or Perish since 2006, version 5 launched late October 2016**

An "amateur" in bibliometrics (1): Journal Quality

- 1993: Conversation with Head of Department: "How do I know which journals are the best journals, I have no clue?"

- Jan 2000: Bradford Management Centre, UK:
    - "Why on earth are we using this "stupid" VSNU journal ranking list that ranks my JIBS publication "C" and all other International Business journals "D" (just like *Brickworks, magazine for the building trade*). I am sure there are better journal rankings lists around"
    - July 2000: The first incarnation of my JQL is published on www.harzing.com
    - 2017: The 58th edition of the JQL with18 rankings, >100 ISI cites + 50,000 page visits/year

- 2009: AMLE Outstanding article of the year award for *"When Knowledge Wins: Transcending the Sense and Nonsense of Academic Rankings"* [most highly cited article in management in 2009]

- 2016: AMLE *"Disseminating knowledge: from potential to reality – New open-access journals collide with convention"*
    - How predatory Open Access journals completely distorted Thomson Reuters Highly Cited Academics ranking (see also http://www.harzing.com/publications/white-papers/authoring-esi-highly-cited-papers)

An "amateur" in bibliometrics (2): Citation analysis

- May 2006: University of Melbourne: Promotion application to professor rejected: "you haven't published enough in A-journals"

- Oct 2006: Publish or Perish v1.0 released

- Jan 2007: Reapplied for promotion showing my work had more citation impact than all but one of the other professors, recent or longstanding

- 2010: The Publish or Perish Book, self-published through Amazon Createspace, reviewed in *Nature*, *Scientometrics* and *JASIST*

- 2017: 200th or so release of Publish or Perish, >270 ISI cites, >2 million page visits to date

Increasing audit culture: Metrics vs. peer review

- Increasing "audit culture" in academia, where universities, departments and individuals are constantly monitored and ranked

- National research assessment exercises, such as the ERA (Australia) and the REF (UK), are becoming increasingly important

- Publications in these national exercises are normally assessed by peer review for Humanities and Social Sciences

- Citations metrics are used in the (Life) Sciences and Engineering as additional input for decision-making

- The argument for not using citation metrics in SSH is that coverage for these disciplines is deemed insufficient in WoS and Scopus

The danger of peer review? (1)

- Peer review might lead to harsher verdicts than bibliometric evidence, especially for disciplines that do not have unified paradigms, such as the Social Sciences and Humanities
  - In Australia (ERA 2010) the average rating for the Social Sciences was only about 60% of that of the (Life) Sciences
    - This is despite the fact that on a citations per paper basis Australia's worldwide rank is similar in all disciplines
    - The low ERA-ranking led to widespread popular commentary that government funding for the Social Sciences should be reduced or removed altogether
  - Similarly negative assessment of the credibility of SSH can be found in the UK (and no doubt in many other countries)

The danger of peer review? (2)

- *More generally, peer review might lead to what I have called "promise over proof"*
  - Harzing, A.W.; Mijnhardt, W. (2015) **Proof over promise: Towards a more inclusive ranking of Dutch academics in Economics & Business**, *Scientometrics,* vol. 102, no. 1, pp. 727-749.

- Assessment of the quality of a publication might be (subconsciously) influenced by the "promise" of:
  - the journal in which it is published,
  - the reputation of the author's affiliation,
  - the sub-discipline (theoretical/modeling vs. applied, hard vs. soft)

- [Promise] Publication in a triple-A journal initially means that 3-4 academics thought your paper was a worthwhile contribution to the field. But what if this paper is subsequently hardly ever cited?

- [Proof] Publication in a "C-journal" with 1,000+ citations means that 1,000 academics thought your paper was a worthwhile contribution to the field

What can we do?

- Be critical about the increasing audit culture

- But: be realistic, we are unlikely to see a reversal of this trend. Hence in order to "emancipate" the Social Sciences and Humanities, an inclusion of citation metrics might help. However, we need to:
  - Raise awareness about:
    - Alternative data sources for citation analysis that are more inclusive (e.g. including books, local and regional journals, reports, working papers)
    - Difficulty of comparing metrics across disciplines because of different publication and citation practices
      - Life Science and Science academics in particular write more (and shorter) papers with more authors each; 10-15 authors not unusual, some >1000 authors
  - Suggest alternative data sources and metrics
    - Google Scholar or Scopus instead of WoS/ISI
    - hIa (Individual annualised h-index), i.e. h-index corrected for career length and number of co-authors
      - measures the average number of single-author equivalent impactful publications an academic publishes a year (usually well below 1.0)

Need for **comprehensive** empirical work across data-sources and metrics

- Dozens of studies comparing two or even three databases. However:
  - Focused on a single or small groups of journals or a small group of academics
  - Only covered a small number of disciplines

- Hence our study provides:
  - Cross-disciplinary comparison across **all** major disciplinary areas
  - Comparison of 4 different metrics:
    - publications, citations, h-index
    - hI,annual (h-index corrected for career length and number of co-authors)

The bibliometric study (1): The basics

- Sample of 146 Associate and Full Professors at the University of Melbourne
  - All main disciplines (Humanities, Social Sciences, Engineering, Sciences, Life Sciences) were represented, 37 sub-disciplines
  - Two full professors (1 male, 1 female) and two associate professors (1 male, 1 female) in each sub-discipline (e.g. management, marketing, accounting, economics)

- Citation metrics in WoS/ISI, Scopus and Google Scholar
  - Collected citation data every 3 months for 2 years
  - Google Scholar data collected with Publish or Perish (http://www.harzing.com/resources/publish-or-perish)
  - WoS/ISI and Scopus collected in the respective databases and imported into Publish or Perish to calculate metrics

- The final conclusion: with appropriate metrics and data sources, citation metrics **can** be applied in the Social Sciences and the Humanities
  - ISI h-index: Life Sciences average lies **180% above** Social Sciences average
  - ISI h-index: Life Sciences average lies **670% above** Humanities average
  - GS hla index: Life Sciences average lies **8% below** Social Sciences average
  - GS hla index: Life Sciences average lies **80% above** Humanities average

The bibliometric study (2): Details on the sample

- Sample: 37 disciplines were grouped into five major disciplinary fields:
    - **Humanities**: Architecture, Building & Planning; Culture & Communication, History; Languages & Linguistics, Law (19 observations),
    - **Social Sciences**: Accounting & Finance; Economics; Education; Management & Marketing; Psychology; Social & Political Sciences (24 observations),
    - **Engineering**: Chemical & Biomolecular Engineering; Computing & Information Systems; Electrical & Electronic Engineering, Infrastructure Engineering, Mechanical Engineering (20 observations),
    - **Sciences**: Botany; Chemistry, Earth Sciences; Genetics; Land & Environment; Mathematics; Optometry; Physics; Veterinary Sciences; Zoology (44 observations),
    - **Life Sciences**: Anatomy & Neurosciece; Audiology; Biochemistry & Molecular Biology; Dentistry; Obstetrics & Gynaecology; Ophthalmology; Microbiology; Pathology; Physiology; Population Health (39 observations).

- Discipline structure followed Department/School structure at the University of Melbourne
    - Overrepresentation of the (Life) Sciences and underrepresentation of Social Sciences beyond Business & Economics
    - Overall, sufficiently varied coverage across the five major disciplinary fields

The bibliometric study (3): Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
WoS Years active	146	3	47	23.84	9.016
Scopus Years active	146	5	46	23.69	8.969
GS Years active	146	8	46	25.64	8.086
WoS Total # of papers	146	3	309	77.25	64.346
Scopus Total # of papers	146	3	309	86.37	68.304
GS Total # of papers	146	22	519	147.46	97.799
WoS Total # of citations	146	0	11287	1871.68	2238.092
Scopus Total # of citations	146	0	11740	1978.27	2179.222
GS Total # of citations	146	58	16507	3290.88	3122.853
WoS h-index	146	0	54	18.91	13.188
Scopus h-index	146	0	48	16.92	10.920
GS h-index	146	3	65	26.06	13.185
WoS hIa index	146	.00	1.07	.3623	.18991
Scopus hIa index	146	.00	1.11	.4075	.19075
GS hIa index	146	.05	1.75	.5757	.26238
Valid N (listwise)	146				

File   Edit   Query   Tools   Help

Query	Source	Papers	Cites	Cites/year	h	g	hI,norm	hI,annual	*Count	Query date	Cache date
094_BORLAND_ISI.txt [2016-10-06 16:15:16]	ISI/WoS (tagged)	45	468	15.60	10	21	8	0.27	0	06/10/2016	06/10/2016
095_Williams_ISI.txt [2016-10-06 16:20:46]	ISI/WoS (tagged)	27	360	24.00	9	18	7	0.47	0	06/10/2016	06/10/2016
096_ERKAL_ISI.txt [2016-10-06 16:28:48]	ISI/WoS (tagged)	20	191	17.36	8	13	6	0.55	0	06/10/2016	06/10/2016
097_SKEELS_ISI.txt [2016-10-06 16:29:48]	ISI/WoS (tagged)	18	65	2.41	4	7	3	0.11	0	06/10/2016	06/10/2016
098_Harzing_ISI.txt [2016-10-06 16:31:00]	ISI/WoS (tagged)	52	2012	125.75	23	44	18	1.13	7	06/10/2016	06/10/2016
099_Lukas_ISI.txt [2016-10-06 16:32:10]	ISI/WoS (tagged)	28	726	34.57	13	26	10	0.48	2	06/10/2016	06/10/2016
100_Bove_ISI.txt [2016-10-06 16:33:32]	ISI/WoS (tagged)	26	382	23.88	10	19	7	0.44	2	06/10/2016	06/10/2016
101_ZYPHUR_ISI.txt [2016-10-06 16:34:38]	ISI/WoS (tagged)	38	1119	101.73	16	33	9	0.82	5	06/10/2016	06/10/2016
102_GUYMER_ISI.txt [2016-10-06 16:36:06]	ISI/WoS (tagged)	273	4038	149.56	34	55	11	0.41	17	06/10/2016	06/10/2016
103_DUSTING_ISI.txt [2016-10-06 16:37:14]	ISI/WoS (tagged)	319	7778	176.77	46	79	21	0.48	13	06/10/2016	06/10/2016
104_Baird_ISI.txt [2016-10-06 16:40:50]	ISI/WoS (tagged)	161	3328	118.86	32	51	10	0.36	11	06/10/2016	06/10/2016
105_LAMOUREUX_ISI.txt [2016-10-06 16:45:36]	ISI/WoS (tagged)	199	2628	175.20	26	42	10	0.67	2	06/10/2016	06/10/2016
106_HICKEY_ISI.txt [2016-10-06 16:46:42]	ISI/WoS (tagged)	112	1229	87.79	20	32	8	0.57	2	06/10/2016	06/10/2016
107_PERMEZEL_ISI.txt [2016-10-06 16:47:56]	ISI/WoS (tagged)	172	3357	129.12	30	53	13	0.50	8	06/10/2016	06/10/2016
108_KORNMAN_ISI.txt [2016-10-06 16:52:44]	ISI/WoS (tagged)	37	1042	37.21	12	32	7	0.25	1	06/10/2016	06/10/2016
109_TONG_ISI.txt [2016-10-06 16:53:54]	ISI/WoS (tagged)	131	503	27.94	12	17	4	0.22	0	06/10/2016	06/10/2016
110_KEAST_ISI.txt [2016-10-06 16:55:44]	ISI/WoS (tagged)	103	3574	111.69	35	56	20	0.63	0	06/10/2016	06/10/2016
111_Pera_ISI.txt [2016-10-08 16:38:42]	ISI/WoS (tagged)	189	11457	293.77	48	106	23	0.59	28	08/10/2016	08/10/2016
112_Fletcher_ISI.txt [2016-10-06 16:59:40]	ISI/WoS (tagged)	107	1915	76.60	27	40	13	0.52	1	06/10/2016	06/10/2016
113_HIME_ISI.txt [2016-10-06 17:39:22]	ISI/WoS (tagged)	46	1156	57.80	14	33	8	0.40	1	06/10/2016	06/10/2016
114_Tilley_ISI.txt [2016-10-06 17:43:50]	ISI/WoS (tagged)	161	5700	154.05	45	69	16	0.43	10	06/10/2016	06/10/2016

Imported external data

Display title: 098_Harzing_ISI.txt [2016-10-06 16:31:00]

Original format: ISI/WoS (tagged)

Imported fields: ☑ Authors ☑ Type ☑ Volume ☐ Article link
☑ Title ☑ Year ☑ Issue no. ☐ Citation link
☑ Publication ☑ ISSN ☑ Start page ☐ Citing references link
☑ Publisher ☑ DOI ☐ End page ☑ Number of citations

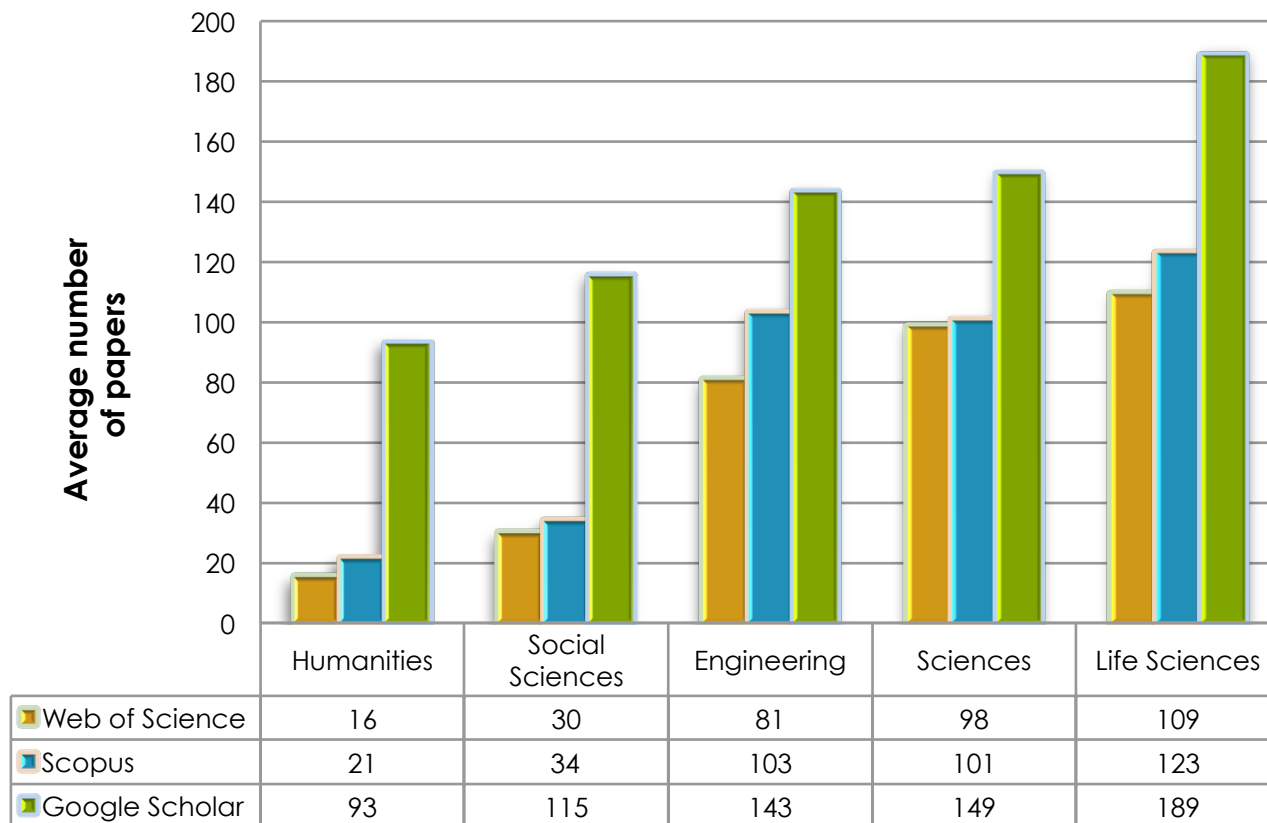Note: Unchecked fields were not available in the imported data.

Metrics

Publication years:	2000-2016
Citation years:	16 (2000-2016)
Papers:	52
Citations:	2012
Cites/year:	125.75
Cites/paper:	38.69
Cites/author:	1306.33
Papers/author:	29.00
Authors/paper:	2.90
h-index:	23
g-index:	44
hI,norm:	18
hI,annual:	1.13
*Count:	7

Cites		Per year	Authors	Title	Year	Publication	Publisher
☑ h	230	32.86*	NJ Adler, AW Harzing	When Knowledge Wins: Transcending the Sense and Nonsense ...	2009	ACADEMY OF MANAGEMENT LEARNING & EDUCATI...	ACAD MANAGEMENT
☑ h	154	11.00*	AW Harzing	Acquisitions versus greenfield investments: International strate...	2002	STRATEGIC MANAGEMENT JOURNAL	JOHN WILEY & SONS LTD
☑ h	149	9.93	AW Harzing	Of bears, bumble-bees, and spiders: The role of expatriates inco...	2001	JOURNAL OF WORLD BUSINESS	ELSEVIER SCIENCE INC
☑ h	118	9.08	AW Harzing, A Sorge	The relative impact of country of origin and universal continge...	2003	ORGANIZATION STUDIES	SAGE PUBLICATIONS LTD
☑ h	104	6.50	AW Harzing	An empirical analysis and extension of the Bartlett and Ghoshal ...	2000	JOURNAL OF INTERNATIONAL BUSINESS STUDIES	JOURNAL INT BUSINESS S
☑ h	103	6.87	AW Harzing	Who's in charge? An empirical study of executive staffing practi...	2001	HUMAN RESOURCE MANAGEMENT	JOHN WILEY & SONS INC
☑ h	100	14.29*	N Noorderhaven, AW Harz...	Knowledge-sharing and social interaction within MNEs	2009	JOURNAL OF INTERNATIONAL BUSINESS STUDIES	PALGRAVE MACMILLAN L
☑ h	92	13.14*	AW Harzing, R van der Wal	A Google Scholar h-Index for Journals: An Alternative Metric to ...	2009	JOURNAL OF THE AMERICAN SOCIETY FOR INFORMA...	JOHN WILEY & SONS INC
☑ h	86	9.56	M Pudelko, AW Harzing	Country-of-origin, localization, or dominance effect? An empiri...	2007	HUMAN RESOURCE MANAGEMENT	WILEY PERIODICALS, INC
☑ h	84	5.25	AW Harzing	Cross-national industrial mail surveys - Why do response rates ...	2000	INDUSTRIAL MARKETING MANAGEMENT	ELSEVIER SCIENCE INC
☑ h	62	5.17	JB Hocking, M Brown, AW...	A knowledge transfer perspective of strategic assignment purp...	2004	INTERNATIONAL JOURNAL OF HUMAN RESOURCE M...	ROUTLEDGE JOURNALS, T
☑ h	61	4.36	AW Harzing	Are our referencing errors undermining our scholarship and cre...	2002	JOURNAL OF ORGANIZATIONAL BEHAVIOR	WILEY-BLACKWELL
☑ h	59	8.43	BS Reiche, AW Harzing, M...	The role of international assignees' social capital in creatinginte...	2009	JOURNAL OF INTERNATIONAL BUSINESS STUDIES	PALGRAVE MACMILLAN L
☑ h	53	5.89	J Mingers, AW Harzing	Ranking journals in business and management: a statistical ana...	2007	EUROPEAN JOURNAL OF INFORMATION SYSTEMS	PALGRAVE MACMILLAN L
☑ h	41	8.20	AW Harzing, K Koster, U M...	Babel in business: The language barrier and its solutions in the...	2011	JOURNAL OF WORLD BUSINESS	ELSEVIER SCIENCE INC
☑ h	40	4.00	AW Harzing, N Noorderha...	Knowledge flows in MNCs: An empirical test and extension of ...	2006	INTERNATIONAL BUSINESS REVIEW	ELSEVIER SCIENCE BV
☑ h	39	13.00*	AW Harzing	A preliminary test of Google Scholar as a source for citation dat...	2013	SCIENTOMETRICS	SPRINGER

Different data-sources between disciplines: number of papers

	Humanities	Social Sciences	Engineering	Sciences	Life Sciences
Web of Science	16	30	81	98	109
Scopus	21	34	103	101	123
Google Scholar	93	115	143	149	189

Different data-sources between disciplines: number of citations

	Humanities	Social Sciences	Engineering	Sciences	Life Sciences
Web of Science	61	591	897	2612	3139
Scopus	100	782	1132	2558	3313
Google Scholar	871	2604	1964	3984	4699
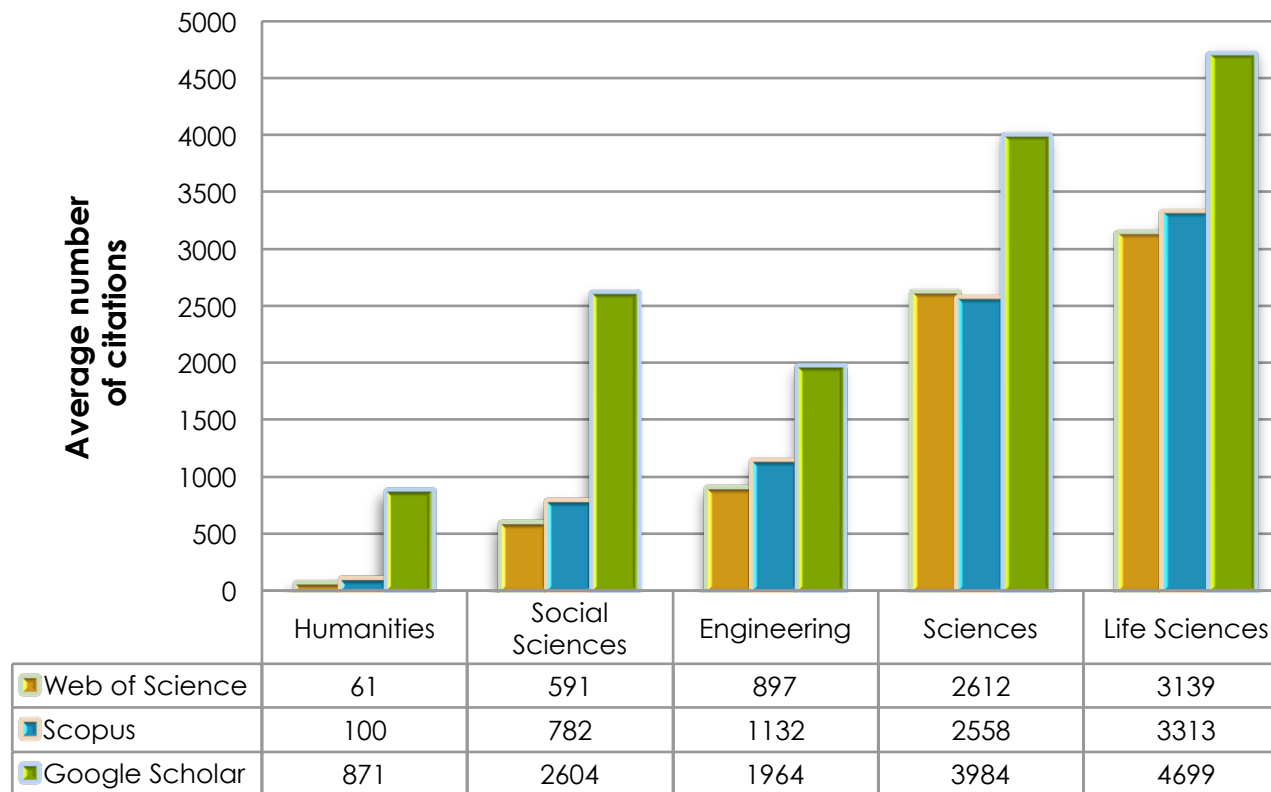
Average number of citations

Different data-sources between disciplines: number of citations

	Web of Science	Scopus	Google Scholar
Humanities	61	100	871
Social Sciences	591	782	2604
Engineering	897	1132	1964
Sciences	2612	2558	3984
Life Sciences	3139	3313	4699

Different data-sources between disciplines: h-index

	Web of Science	Scopus	Google Scholar
Humanities	3.5	4.3	12.3
Social Sciences	9.6	12.0	21.5
Engineering	13.5	15.6	20.8
Sciences	25.6	25.6	30.1
Life Sciences	27.1	28.3	33.4
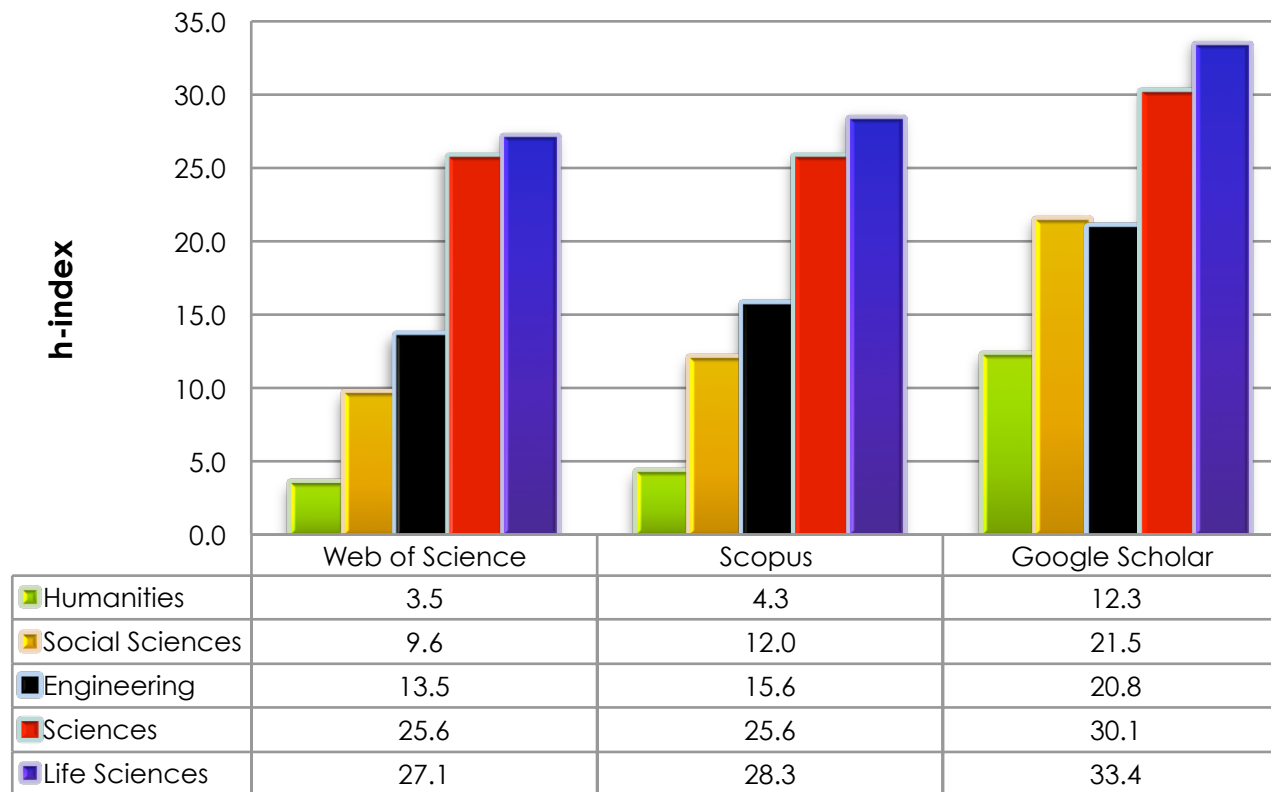
Different data-sources between disciplines: hla index

	Web of Science	Scopus	Google Scholar
Humanities	0.14	0.18	0.36
Social Sciences	0.32	0.42	0.66
Engineering	0.33	0.41	0.53
Sciences	0.44	0.45	0.57
Life Sciences	0.43	0.46	0.65
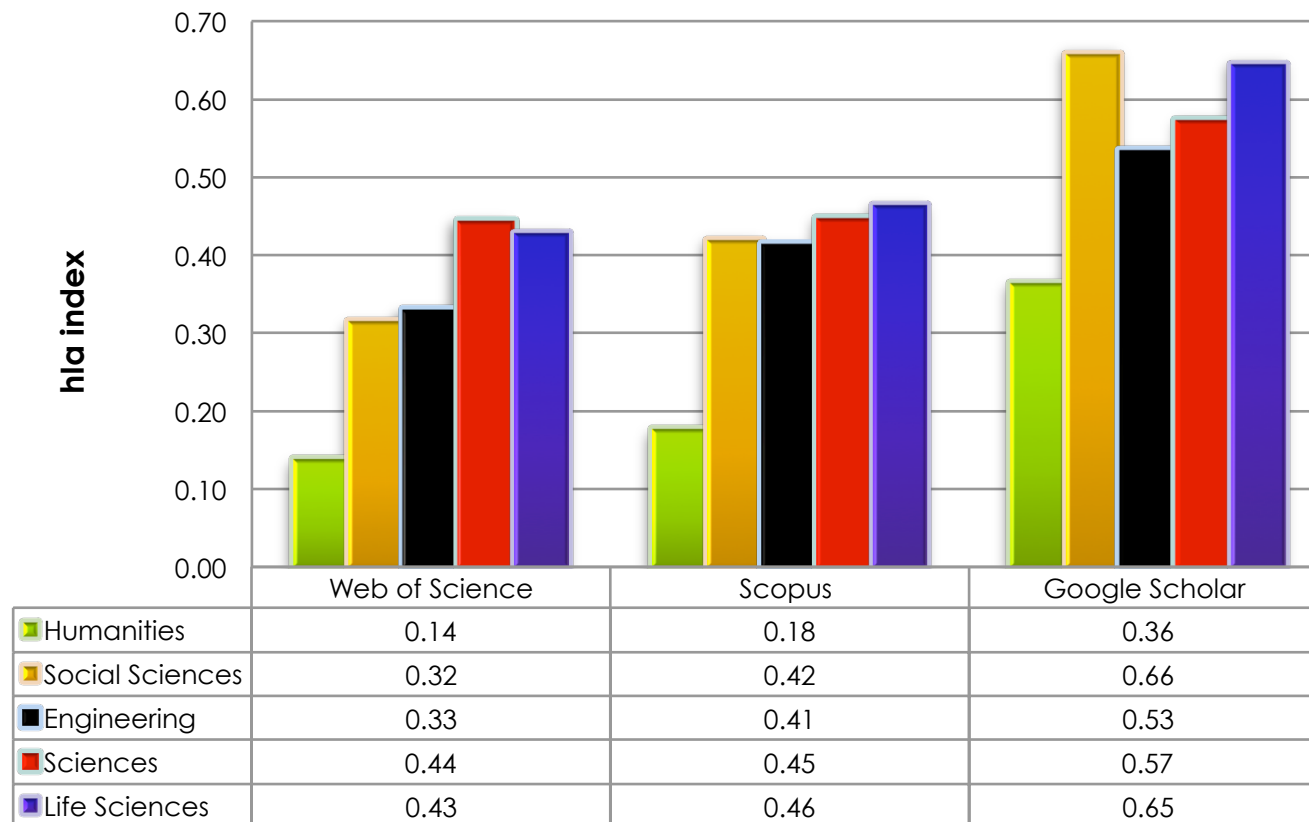
hla: h-index corrected for academic age (to accommodate differences in career length) and number of co-authors (to remove discipline bias)

Comparing WoS h-index with Scopus or GS hIa

Discipline	Web of Science h-index	Life Sciences = 100	Scopus hIa	Life Sciences = 100	Google Scholar hIa	Life Sciences = 100
Humanities	3.5	13	0.18	38	0.36	56
Social Sciences	9.6	36	0.42	91	0.66	102
Engineering	13.5	50	0.41	89	0.53	82
Sciences	25.6	95	0.45	96	0.57	89
Life Sciences	27.1	100	0.46	100	0.65	100

Different data-sources between disciplines: Statistics

- For the ISI h-index gender, rank and discipline differences explain nearly 60% of the variance

- For GS hIa, the explained variance is only 14%
  - Reduction of differences across levels of appointment
  - Reduction of differences across disciplines

	ISI h-index		Google Scholar hIa	
	Stand. Beta	**Significance**	**Stand. Beta**	**Significance**
Gender = Female	-0.066	0.222	-0.017	0.822
Rank Professor	0.361	**0.000**	0.217	**0.006**
Humanities	-0.591	**0.000**	-0.356	**0.000**
Social Sciences	-0.491	**0.000**	0.020	0.816
Engineering	-0.357	**0.000**	-0.149	0.087
Sciences	-0.045	0.468	-0.123	0.178
Adjusted R-square	**0.591**		**0.139**	

Quick comparison across disciplines

- H-index ISI data
  - Life Sciences vs. Humanities: 27 vs. 3.5
    - i.e. nearly 8 times as high
  - Life Sciences vs. Social Sciences: 27 vs. 9.5
    - i.e. nearly 3 times as high

- hla-index GS data
  - Life Sciences vs. Humanities: 0.61 vs. 0.34
    - i.e. nearly 2 times as high
  - Life Sciences vs. Social Sciences: 0.61 vs. 0.66
    - i.e. 8% lower

Individual comparisons for the three databases

	number of academics (out of 146) for whom the metric in question is higher or lower than the corresponding metric in the WoS					
	Higher than WoS	< 5% Lower	5%-10% Lower	10%-25% Lower	>25% Lower	Affected academics
GS publications	143	2	0	0	1	None; differences are caused by Web of Science errors + one mega-authored paper
GS citations	145	0	0	1	0	
GS h-index	145	1	0	0	0	
GS hIa	146	0	0	0	0	
Scopus publications	133	3	5	4	1	Older academics Social Sciences 13%* Humanities 21% Life Sciences 28% Sciences 43%
Scopus citations	110	6	7	15	8	
Scopus h-index	115	9	8	11	3	
Scopus hIa	113	3	10	17	3	

Conclusion

- Will the use of citation metrics disadvantage the Social Sciences and Humanities?
  - Not, if you use a database that includes publications important in those disciplines (e.g. books, national journals)
  - Not, if you correct for differences in co-authorships

- Is peer review better than metrics in the Social Sciences and Humanities?
  - Yes, in a way…. The **ideal version** of peer review (informed, dedicated, and unbiased experts) is better than a **reductionist version** of metrics (ISI h-index or citations)
  - **However**, the **inclusive version** of metrics (GS hIa) is probably better than the likely **reality** of peer review (hurried semi-experts, potentially influenced by journal outlet and affiliation)

- In research evaluation at any level use a combination of peer review and metrics wherever possible, but:
  - If reviewers are not experts, metrics might be a better alternative
  - If metrics are used, use an inclusive database (GS or Scopus) and career and discipline adjusted metrics

Want to know more?

- Harzing, A.W.; Alakangas, S. (2016) Google Scholar, Scopus and the Web of Science: A longitudinal and cross-disciplinary comparison, *Scientometrics*, 106(2): 787-804.

- For more details see: http://www.harzing.com/research/quality-and-impact-of-academic-research

- Any questions?

Further reading on Google Scholar as a source for citation data

- Harzing, A.W.; Wal, R. van der (2008) Google Scholar as a new source for citation analysis?, *Ethics in Science and Environmental Politics*, 8(1): 62-71

- Harzing, A.W.; Wal, R. van der (2009) A Google Scholar h-index for Journals: An alternative metric to measure journal impact in Economics & Business?, *Journal of the American Society for Information Science and Technology*, 60(1): 41-46.

- Harzing, A.W. (2013) A preliminary test of Google Scholar as a source for citation data: A longitudinal study of Nobel Prize winners, *Scientometrics*, 93(3): 1057-1075.

- Harzing, A.W. (2014) A longitudinal study of Google Scholar coverage between 2012 and 2013, *Scientometrics*, 98(1): 565-575.

- Harzing, A.W.; Alakangas, S. (2016) Google Scholar, Scopus and the Web of Science: A longitudinal and cross-disciplinary comparison, *Scientometrics*,106(2): 787-804.

Further reading on problems with the Web of Science and new metrics

- Harzing, A.W. (2013) Document categories in the ISI Web of Knowledge: Misunderstanding the Social Sciences?, *Scientometrics,* 93(1): 23-34.

- Harzing, A.W.; Alakangas, S.; Adams, D. (2014) hIa: An individual annual h-index to accommodate disciplinary and career length differences, *Scientometrics*, 99(3): 811-821.

- Harzing, A.W.; Mijnhardt, W. (2015) Proof over promise: Towards a more inclusive ranking of Dutch academics in Economics & Business, *Scientometrics*, 102(1): 727-749.

- Harzing, A.W. (2015) Health warning: Might contain multiple personalities. The problem of homonyms in Thomson Reuters Essential Science Indicators, *Scientometrics*,105(3): 2259-2270.

- Harzing, A.W. (2017) Microsoft Academic (Search): a Phoenix arisen from the ashes?, *Scientometrics,* 108(3):1637-1647