

Chapter Title: Win Friends and Influence Faculty: Methods for Citation Analysis

Book Title: Something's Gotta Give

Book Subtitle: Charleston Conference Proceedings, 2011

Book Editor(s): Beth R. Bernhardt, Leah H. Hinds, Katina P. Strauch

Published by: Purdue University Press. (2012)

Stable URL: <https://www.jstor.org/stable/j.ctt6wq4sf.99>

---

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <https://about.jstor.org/terms>



This book is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (CC BY-NC-ND 4.0). To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc-nd/4.0/>.



JSTOR

*Purdue University Press* is collaborating with JSTOR to digitize, preserve and extend access to *Something's Gotta Give*

# Win Friends and Influence Faculty: Methods for Citation Analysis

*Leslie Farison, Assistant Professor, Business Librarian, Appalachian State University*

## Abstract:

Citation analysis is a way to analyze references cited in scholarly publications. It is common for academic organizations to evaluate faculty research and publication records, especially for hiring, pay, promotion and tenure decisions, by comparing the quality and quantity of a candidate's research with that of their peers. One of the ways for a faculty member to demonstrate the impact of their work in a field is to conduct a citation analysis. This paper examines the capabilities and problems associated with various commercial products that can be used to conduct a citation analysis and looks at the strengths and limitations of using Google Scholar as a citation tool. The paper concludes that since all sources miss some citations the best practice is not to rely solely on one source given that the most comprehensive results are achieved by consulting multiple sources.

## What is Citation Analysis?

Citations are the formal, explicit linkages between scholarly works that have particular points in common and measuring these citations is one way to analyze references cited in scholarly publications. There are many methods and metrics for evaluating scholarly research. Moreover different data sources and different citations metrics can lead to very different conclusions. This paper deals with a method of counting citations called "citation analysis". Citation analysis is an increasingly common way to evaluate research impact since, theoretically, the more a work is accessed, read and used, the more the research has contributed to the field. The total number of citations is a fairly objective measure of the material's importance to current research. Many believe that counting citations is more appropriate and objective than other metrics such as journal impact factors or rankings because citation analysis looks at the article or publication itself and not the container in which it is published.

## How is it used?

It is common for academic organizations to evaluate faculty research and publication records, especially for hiring, pay, promotion and tenure decisions, by comparing the quality and quantity of a candidate's research with that of their peers. One of the ways for a faculty member to demonstrate the impact of their work in a field is to conduct a citation analysis. The faculty member's goal in conducting a citation analysis is to present a compelling case for the research impact of their scholarly work.

As a measure of faculty research impact, citation analysis can also inform funding decisions for internal

and external grants, help faculty decide which titles to target for submitting their work for publication and enlighten collection development decisions.

## Common Problems

Faculty are frequently frustrated if their publication is in a journal or book or conference proceeding that is not included in the traditional citation index products like Thompson's ISI Web of Science or Elsevier's SCOPUS product. There might be various reasons that a publication is not included. These commercial products are both very strong in coverage of peer-reviewed science journals but other disciplines are not as well covered. Some formats beyond journals, such as books or conference proceedings, are not adequately represented in some cases. There is often limited geographical coverage and publications in languages other than English are frequently not included. Finally, commercial citation products are often expensive and access is limited for researchers at institutions that cannot afford to provide these products.

## Thompson's ISI Web of Science<sup>SM</sup>

Originally launched in print in the 1960's, the Science Citation Index was originally developed by the Institute for Scientific Information (ISI) to address the needs of researchers in the fields of molecular biology and biochemistry and still has the strongest coverage in those and other scientific disciplines. For many years the ISI databases have been used as a starting point, and often as the only tool, for locating citations and conducting citation analyses, primarily because they were the only general and comprehensive citation databases in existence. (Moed 2005, 126). ISI was acquired by Thompson in

1992 and transformed into an electronic product (De Bellis 2009, 39). The base product, Web of Science<sup>SM</sup> (WoS), includes three indexes:

- Science Citation Index Expanded
- Social Sciences Citation Index Citation Index
- Arts & Humanities Citation Index

(Note: Thompson offers other products that can be integrated on the Web of Knowledge<sup>TM</sup> (WoK) platform at additional cost.)

Titles covered in the WoS indexes are limited to ISI-listed journals. Therefore, publications from disciplines that are not well covered in WoS are less likely to be included. Figure 1 shows a chart detailing the adequacy of coverage for various disciplines.

Figure 1

Adequacy of ISI coverage from the point of view of research evaluation

Excellent	Good	Moderate
Molecular biology & Biochemistry	Applied physics & chemistry	Humanities & arts
Biological Sciences related to humans	Biological Sciences related to animals & plants	Business
Clinical medicine	Psychology & psychiatry	History
Physics & astronomy	Other social sciences related to medicine & health	Other social sciences
Chemistry	Geosciences	
	Mathematics	
	Engineering	
	Economics	

(Moed 2005, 42)

If a publication is included in WoS there are several great tools for analyzing citations. A **Cited Reference Search** starts with a known citation and either identifies documents it cites or identifies source records for documents that cite it. A **Citation Re-**

**port** that shows various metrics including total citations, publications per year, citations per year and the number of unique citing articles can be created for an author. Figure 2 shows an example of a Citation Report from WoS.

Figure 2



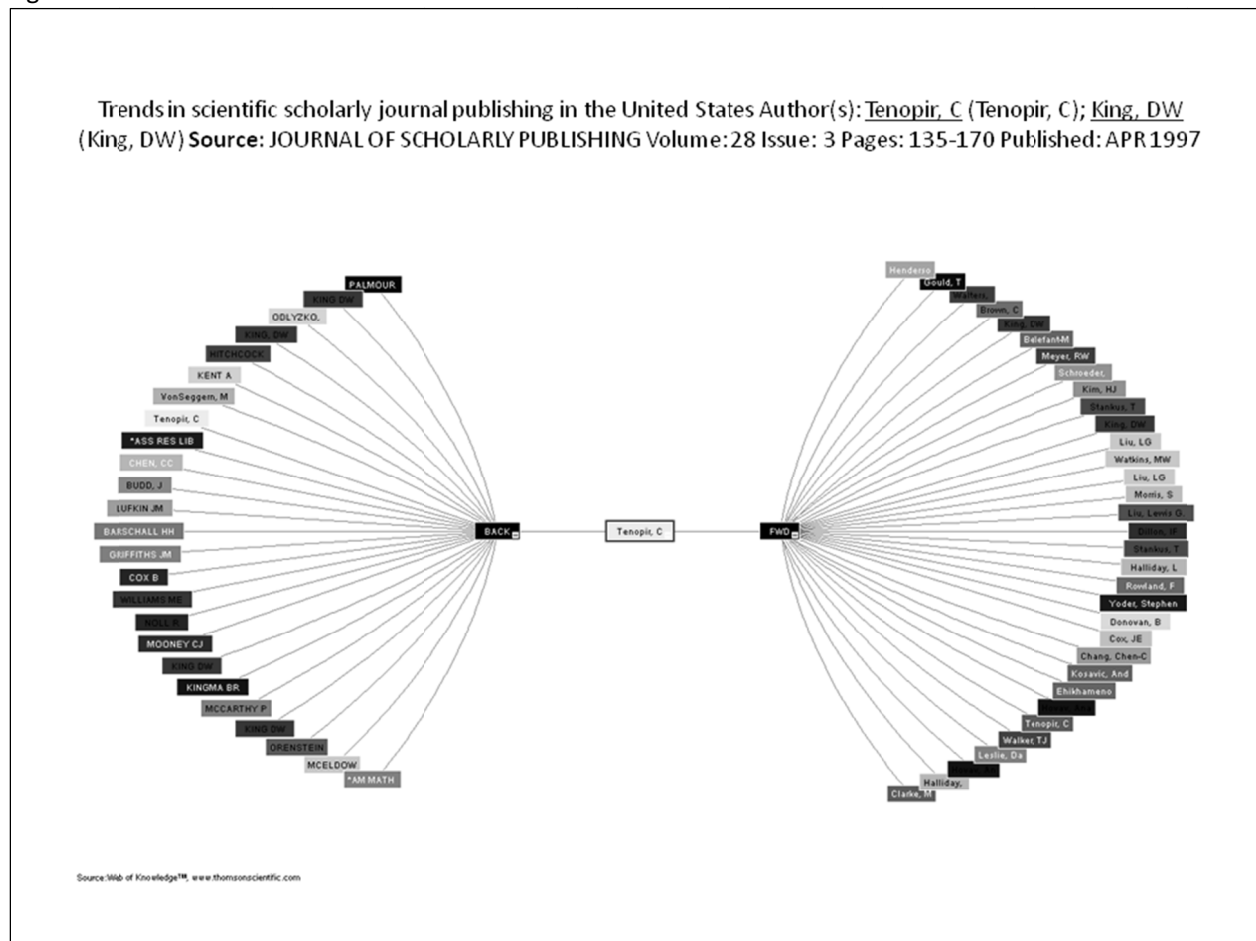
Source: Web of Knowledge™, [www.thompsonscientific.com](http://www.thompsonscientific.com)

WoS also offers a citation mapping tool that allows the user to generate a **Citation Map** visualizing the relationship between citing and cited references. This tool allows mapping a citation forward (items published later in time that cite it) or backward (items published earlier in time that it cites). One can also select to go backward or forward one or two generations. The first generation shows cited and citing information for the paper being mapped. The second generation extends to show citing and cited information for the first generation results.

The citation map shown in Figure 3 is an example of selecting “both” (forward and backward citations) and “one generation”.

Drop down menus allow the user to change the appearance of the citation map by specifying the node text (for example, author or titles) and the order and color of the nodes. Color coding enables one to group together those nodes that share certain similarities.

Figure 3



### Elsevier's SCOPUS

Commercially launched in 2004, SCOPUS, a product of Elsevier Publishing Co., also focused on science-technology-medicine (STM) literature plus more limited coverage of the social sciences (Dess 2006, 1).

This author did not have access to SCOPUS so less detail about the product is provided in this paper. From the SCOPUS website and various product reviews SCOPUS seems to contain more journal document entries than ISI but date coverage does not extend back as far. In addition to journals, Scopus contains citations for some trade publications, book series and conference proceedings. SCOPUS seems to include significantly more non U.S. titles and materials in other languages although English language abstracts are available for non-English publications.

Even without institutional access some information can be retrieved from SCOPUS through the free **Author Preview** tool located on their web site at <http://www.scopus.com/search/form/authorFreeLookup.url>. This allows a researcher to search and determine which of their publications are included in SCOPUS and retrieve basic bibliometric information such as the date range, number of documents, references and citations contained in the SCOPUS database.

The SCOPUS content coverage guide located on the SCOPUS website contains a freely available link to a list of titles that can be opened in an Excel spreadsheet with drop down filters that allow a user to identify coverage of particular disciplines. A very useful color coded hierarchy shown in Figure 4 makes sorting, filtering and identifying titles by discipline fairly straightforward.

Figure 4

Life Sciences: Green	Social Sciences: Blue	Physical Sciences: Yellow	Health Sciences: Red
Agricultural and Biological Sciences	Arts and Humanities	Chemical Engineering	Medicine
Biochemistry, Genetics and Molecular Biology	Business, Management and Accounting	Chemistry	Nursing
Immunology and Microbiology	Decision Sciences	Computer Science	Veterinary
Neuroscience	Economics, Econometrics and Finance	Earth and Planetary Sciences	Dentistry
Pharmacology, Toxicology and Pharmaceuticals	Psychology	Energy	Health Professions
	Social Sciences	Engineering	
		Environmental Science	
		Materials Science	
		Mathematics	
		Physics and Astronomy	

Many titles are listed in more than one subject area so there is significant overlap in the categories. Figure 5 shows a diagram demonstrating

overlap in the related fields of business, economics and psychology.

Figure 5

### SCOPUS Business , Economics & Psychology Coverage



Source Data: [List of titles](#) (xlsx) from <http://www.info.sciverse.com/scopus/scopus-in-detail/facts> retrieved 12/16/2011

## Google Scholar

Another option that a faculty member can utilize to conduct a citation analysis is Google Scholar (GS). One of the biggest advantages of GS is that it is free and available to anyone with an internet connection. The tremendous scope of new scholarly archives like GS makes it possible to freely access citation data for millions of publications and authors. GS covers a huge number of documents by crawling the web automatically in the same manner as a web browser and includes the papers from several digital libraries as well. GS automatically extracts the bibliographic data from the reference sections of the documents and determines citation counts for full text documents and abstracts in its collections. The results of a search are typically sorted by the total number of citations from high to low with the most cited publications appearing first.

Utilization of GS generally results in more comprehensive coverage in disciplines not well covered in ISI or SCOPUS and some disciplines seem to benefit from GS's better coverage of citations in a wide range of publication types. Those disciplines include Business, Administration, Finance & Economics, Engineering, Computer Science & Mathematics and Social Sciences, Arts & Humanities.

There are also limitations to using Google Scholar for citation analysis. First, not all scholarly journals are indexed in Google Scholar (but then no tool indexes all scholarly journals) and while GS covers mostly scholarly publication in academic publications it sometimes includes non-scholarly citations. Because GS obtains citations by crawling the web it does not perform as well for older publications. These publications and the publications that cite them have not yet been posted on the web. Another possible problem is that while the crawling method results in a large number of documents metadata can be incomplete. Critics of Google Scholar don't like the fact that, unlike the process commercial products use that

involves manual handling and checking of each record, processing for GS is automatic and occasional errors and nonsensical results occur. Unlike the commercial databases, GS provides minimal information about the content and there are no coverage lists of resources or publishers.

## Tools for Google Scholar: Publish or Perish

Several articles and papers written by Professor Anne-Wil Harzing, Professor in International Management and Associate Dean of Research at the University of Melbourne, Australia, discuss using Google Scholar as a citation tool. Dr. Harzing's field of International Management is one of those not well represented in ISI or SCOPUS. After being rejected for promotion to full professor the first time she applied, Dr. Harzing realized that she would have to make a strong case for her research and publications another way. She then developed a software program called *Publish or Perish* and an accompanying book. The program interfaces with Google Scholar, collects data from it and calculates multiple metrics from that data. The program can be downloaded at no cost at the following URL: <http://www.harzing.com/>. The book is called *The Publish or Perish Book: Your guide to effective and responsible citation analysis* and serves as both a manual for the program and a guide for conducting and interpreting citation analysis. These tools assisted Dr. Harzing in her successful second application for full professor. (Bensman 2011, 339)

The results retrieved using Publish or Perish program are reasonably accurate when conducting a Journal impact analysis or General citation search but the Author impact analysis often produces results that needs to be cleaned up to insure that incorrect authors are excluded from the results. In addition to the various simple statistics (number of papers, number of citations, etc) Publish or Perish calculates other more complex citation metrics as shown in Figure 6.

Figure 6

Author impact | Journal impact | **General citations** | Multi-query center | Web Browser

**General citation search - Perform a general citation search**

Author(s): I farison  
Publication: journal of education for library  
All of the words: teaching  
Any of the words:  
None of the words:  
The phrase:  
Year of publication between: 0 and: 0  
☐ Title words only

☒ Biology, Life Sciences, Environmental Science  
☒ Business, Administration, Finance, Economics  
☒ Chemistry and Materials Science  
☒ Engineering, Computer Science, Mathematics  
☒ Medicine, Pharmacology, Veterinary Science  
☒ Physics, Astronomy, Planetary Science  
☒ Social Sciences, Arts, Humanities

Buttons: Lookup, Lookup Direct, Help

**Results**

Papers:	1	Cites/paper:	8.00	h-index:	1	AWCR:	2.00
Citations:	8	Cites/author:	2.67	g-index:	1	AW-index:	1.41
Years:	4	Papers/author:	0.33	hc-index:	1	AWCRpA:	0.67
Cites/year:	2.00	Authors/paper:	3.00	hi-index:	0.33	e-index:	2.65
				hi,norm:	1	hm-index:	0.33

Cites	Per year	Rank	Authors	Title	Year	Publication	Publisher
<input checked="" type="checkbox"/> 8	2.00	1	..., AM Johnson, L F...	What the teachers are teaching: Ho...	2008	Journal of education for libr...	cat.inist.fr

Buttons: Copy >, Copy results, Check all, Check selection, Uncheck all, Uncheck 0 cites, Uncheck selection, Help

Harzing, A.W. (2007) **Publish or Perish**, available from <http://www.harzing.com/pop.htm>

## Tools for Google Scholar:

### Google Scholar Citations-Gadget

Recently Google Scholar has added a feature called Google Scholar Citations that provides a way for authors to keep track of citations to their publications. An author can also graph citations over time and compute several citation metrics. The author creates a profile that includes his/her name, affiliation, email and areas of interest. Next a list of publi-

cations by the author appears and allows selection of those to add to the profile.

There are two ways for the profile to be updated as new citation information occurs, automatically or manually. Once the profile is set up the author can access citation reports as shown in Figure 7.

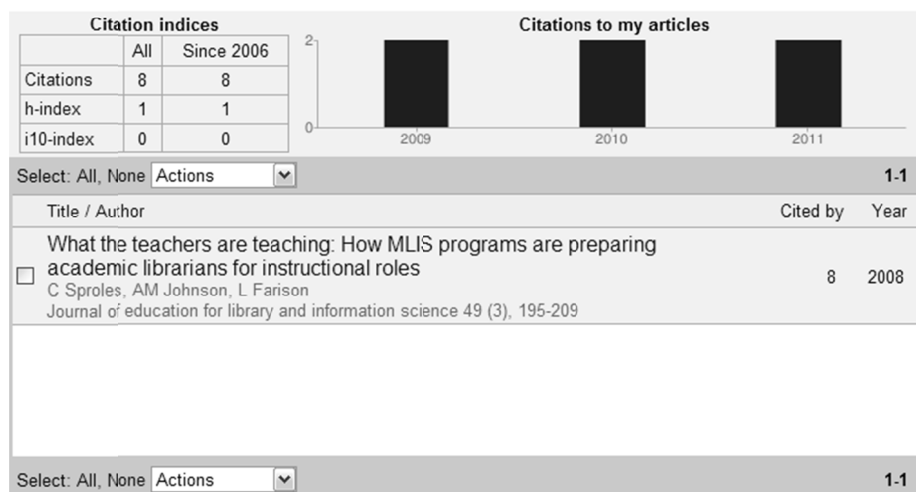


 **Leslie Farison** Edit  
 Appalachian State University Edit  
 Citation Analysis - Libraries - international Librarianship Edit  
 Verified email at appstate.edu Edit  
 My profile is private Edit Add homepage

[Change photo](#)

Google scholar

My Citations - Help



**Co-authors**

No co-authors

Name

Email

☐ Inviting co-author

**Suggested co-authors**

C Sproles [Find - X](#)

A Johnson [Find - X](#)

[View all co-authors](#)

Dates and citation counts are estimated and are determined automatically by a computer program.

©2011 Google - About Google Scholar - All About Google - Provide feedback - My Citations

## Conclusion

All sources and tools for citations analysis have their own strengths and weaknesses. Using Google Scholar often results in more comprehensive coverage in disciplines not well covered in ISI or SCOPUS. It is often necessary to clean up the results obtained from Google Scholar before analyzing them but it is worth the effort for faculty to make sure that their scholarship is presented in the most comprehensive way. All sources miss some citations; therefore, the best practice is not to rely solely on one source in view of the fact that the most comprehensive results are achieved by consulting multiple sources.

## References

- Adler, Nancy J. and Anne-Wil Harzing. 2009. "When Knowledge Wins: Transcending the Sense and Nonsense of Academic Rankings." *The Academy of Management Learning and Education (AMLE)* 8 (1): 72-95.
- Robert Adler, John Ewing and Peter Taylor. 2009. "Citation Statistics." *Statistical Science* 24 (1):1-14
- De Bellis, Nicola. 2009. *Bibliometrics and Citation Analysis: From the Science Citation Index to Cybermetrics*. Lanham, Md.: Scarecrow Press

- Dess, Howard M. 2006. "Database Reviews and Reports." *Issues in Science and Technology Librarianship* 45 (Winter)
- Eom, Sean B. 2009. *Author Cocitation Analysis: Quantitative Methods for Mapping the Intellectual Structure of an Academic Discipline*. Hershey, PA: Information Science Reference
- Harzing, Anne-Wil and Ron van der Wal (2008) "Google Scholar as a new source for citation analysis?" *Ethics in Science and Environmental Politics* 8 (1): 62-71.
- Harzing, Anne-Wil. 2010. "Citation analysis across disciplines: The Impact of different data sources and citation metrics." [www.harzing.com](http://www.harzing.com) white paper.
- Jasco, Peter. 2005. "As we may search – Comparison of major features of Web of Science, Scopus and GoogleScholar citation-based and citation-enhanced databases". *Current Science* 89 (9): 1537–1547.
- Meho, Lokman I and Kiduk Yang. 2007. "Impact of data sources on citation counts and rankings of LIS faculty: Web of science versus scopus and google scholar." *Journal of the American Society for Information Science*

- and Technology* 58: 2105–2125. doi: 10.1002/asi.20677
- Moed, Henk F. 2005. Citation analysis in research evaluation. Berlin: Springer.
- Roth, D. L. 2005. "The emergence of competitors to the Science Citation Index and Web of Science." *Current Science* 89(9): 1531-1536.
- Simboli, Brian D. 2008. "Electronic Resources Reviews: Web of Science's "Citation Mapping" Tool." *Issues in Science and Technology Librarianship* 54 (Summer)