Journal Impact factors: what they mean, what they don't mean, and why you should care



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Stokes Library
Wallace Hall
Lunch and Learn
November 30, 2011



Publish or Perish

- One's publication record is a key component of hiring, tenure and promotion decisions.
- Grant agencies want their money to support research that is widely distributed/relevant.

"I did all that research...

- Are people reading my work?
 - To me, this is a much more interesting question than which journals are most highly read.
- However, I am frequently asked by researchers for suggestions of the best journal for them to submit their work to.
 - The underlying assumption is that the more visible the journal is, the more your paper will get seen and (hopefully) read and (hopefully) cited.

Overview of session

- What is a citation?
- What is impact?
- What is a bibliographic database?
- Web of Science (a.k.a. Science Citation Index/Social Science Citation Index)
- Journal Citation Reports
- Journal's Impact Factor
- Google Scholar as an alternative to Web of Science
- Alternative measures of Impact Factor (briefly, if time)
- How do you decide the "best journal" to publish in?
- What is the best way to keep track of who's citing me?

Basic Definitions

- Impact = effect.
- Citation= entries in a list of references at the end of an article, chapter, book, etc.
- Database=collection of records about, for example, articles published in a particular field.

Impact of one article

- Looking for a way to quantify an article's impact.
- The simplest measure of impact is "Times Cited."
- Whether being cited is an indication of impact requires a leap of faith.

But even the simplest measure of impact (Times Cited) quickly gets complicated

- What counts as a citation?
 - Self-citation?
 - Citation by one's co-authors?
 - Citation in a book chapter? Working paper? Dissertation? Conference presentation?
 - Only citations in peer-reviewed journal articles?

Continued...But even the simplest measure of impact (Times Cited) quickly gets complicated

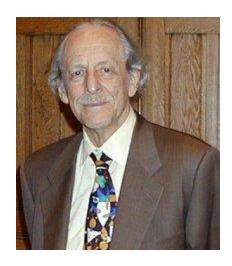
- •The older the article the more potential for citations. The total number of citations doesn't control for this.
- •Some fields are much larger and would therefore have more citations.

The person who has given more thought to these questions than anyone else is Eugene Garfield

Citation Indexes for Science

A New Dimension in Documentation through Association of Ideas

Eugene Garfield



Eugene Garfield, Ph.D.

"The uncritical citation of disputed data by a writer, whether it be deliberate or not, is a serious matter. Of course, knowingly propagandizing unsubstantiated claims is particularly abhorrent, but just as many naive students may be swayed by unfounded assertions presented by a writer who is unaware of the criticisms. Buried in scholarly journals, critical notes are increasingly likely to be overlooked with the passage of time, while the studies to which they pertain, having been reported more widely, are apt to be rediscovered." (1)

In this paper I propose a hibliographic system for science literature that can eliminate the uncritical citation of fraudulent, incomplete, or obsolete data by making it possible for the conscientious scholar to be aware of criticisms of earlier papers. It is too much to expect a research worker to spend an inordinate amount of time searching for the bibliographic descendants of antecedent papers. It would not be excessive to demand that the thorough scholar check all papers that have cited or criticized such papers, if they could be located quickly. The citation index makes this check practicable. Even if there were no other use for a citation index than that of minimizing the citation of poor data, the index would be well worth the effort required to compile it.

This paper considers the possible utility of a citation index that offers a new approach to subject control of the literature of science. By virtue of its different construction, it tends to bring together material that would never be collated by the usual subject indexing. It is best described as an association-of-ideas index, and it gives the reader as much leeway as he requires. Suggestiveness through association-of-ideas is offered by conventional subject indexes but only within the limits of a particular subject heading.

If one considers the book as the macro unit of thought and the periodical article the micro unit of thought, then the citation index in some respects deals in the submicro or molecular unit of thought. It is here that most indexes are inadequate, hecause the scientist is quite often concerned with a particular idea rather than with a complete concept. "Thought" indexes can be extremely useful if they are properly conceived and developed.

In the literature-searching process, indexes play only a small, although significant, part. Those who seek comprehensive indexes to the literature of science fail to point out that such indexes, although they may be desirable, will provide only a better starting point than the one provided in the selective indexes at present available. One of the basic difficulties is to build subject indexes that can anticipate the infinite number of possible approaches the scientist may require. Proponents of classified indexes may suggest that classification is the solution to this problem, but this is by no means the

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Like every field...

- Garfield developed what were referred to as "Citation Indexes" to compile information about citation counts.
- These citations indexes evolved into the present day Web of Science
- nb: earlier versions of WoS were referred to as the discipline specific Science Citation Index and Social Science Citation Index

Web of Science

- We can talk about the impact of one article, one author, or one journal. All of this comes from the database Web of Science and the related product, Journal Citation Reports.
 - Bibliographic database.
 - http://isiknowledge.com/wos
- Alternatives to using Web of Science exist, most notably Google Scholar.

The workings of Web of Science

- Journals aren't included in Web of Science until they have a "proven publication record."
- Once Web of Science accepts a journal into its list of covered journals...
- The bibliographic information of each article of each issue of the journal is added to their database PLUS the References at the end of the article (REGARDLESS of whether or not the journal it appeared in is one of the journals Web of Science covers.)

References from back of article

MORTALITY DIFFERENTIALS BY MARITAL-STATUS - AN INTERNATIONAL COMPARISON

Author(s): HU, YR (HU, YR); GOLDMAN, N (GOLDMAN, N)

Source: DEMOGRAPHY Volume: 27 Issue: 2 Pages: 233-250 DOI: 10.2307/2061451 Published: MAY 1990

References

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References as they appear in Web of Science
Times Cited: 228 (from Web of Science)
Cited References: 28 [view related records]
Citation Map

These first two are books.
Since books aren't covered in WoS there is no title.

There are 228 articles that cite this one

There are a total of 28 references (a.k.a. Cited References)

Cited References

Title: MORTALITY DIFFERENTIALS BY MARITAL-STATUS - AN

Author(s): HU YR; GOLDMAN N

Source: DEMOGRAPHY Volume: 27 Issue: 2 Pages: 233-250 DOI:

Citation Map

References: 28



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Find Related Records

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1. Title: [not available]

Author(s): BAKER RJ

Source: GLIM MANUAL RELEASE Volume: 3 Published: 1978

Times Cited: 6 (from Web of Science)

Find it©p∪L

Z. Title: [not available]

Author(s): BISHOP Y

Source: DISCRETE MULTIVARIAT Published: 1975

Times Cited: 4,603 (from Web of Science)

Find it©p∪L

3. Title: MORTALITY OF WIDOWS SHORTLY AFTER WIDOWHOOD

Author(s): COX PR; FORD JR

Source: LANCET Volume: 1 Issue: 732 Pages: 163-& Published: 1964

Times Cited: 88 (from Web of Science)

Find it©puL

4. Title: [not available]

Author(s): FOX AJ

Source: LONGITUDINAL STUDY S Published: 1982

Times Cited: 70 (from Web of Science)

Find it©PUL

5. Title: SEX, MARITAL STATUS, AND MORTALITY

Author(s): GOVE WR

Source: AMERICAN JOURNAL OF SOCIOLOGY Volume: 79 Issue: 1 Pages: 45-6

Times Cited: 339 (from Web of Science)

Find it©PUL → Full Text

WEB OF SCIENCE COVERAGE:

- Over 1,600 regional journals recently added
- Over 46 million records across the Sciences, Social Sciences. Arts and Humanities
- → Conference Proceedings Citation Index™ — 1990 to present Fully indexes over 148,000 conference titles in the Sciences and Social Sciences with 12,000 conferences added annually
- Science Citation Index Expanded™ — 1900 to present Fully indexes over 8,300 major journals across 150 disciplines
- → Social Sciences Citation Index™ — 1900 to present Fully indexes over 4,500 social sciences journals, covering the most significant social sciences discoveries from all of the 20th century.
- Arts & Humanities Citation Index® — to 1975 to present Fully indexes over 2,300 arts and humanities journals, as well as selected items from over 250 scientific and social sciences journals

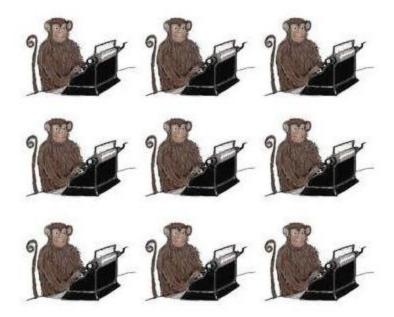
Coverage is highly selective back to 1900. Still...it is a very large database.



Web of Science entries evolved in a time when computer storage was expensive and data entry unsophisticated.

Harvard University, Baker Library, Harvard Business School, W280064_1

I always think of monkeys entering the references because obvious errors appear that could have been corrected. To correct them would have been too labor intensive.



TTTLE: Journal impact factors and self-citations: Implications for psychology journals

AUTHOR(S): Anseel F (REPRINT); Duyck W; De Baene W; Brysbaert M JOURNAL: AMERICAN PSYCHOLOGIST, 2004, V59, N1 (JAN), P49-51 CITED REFERENCES:

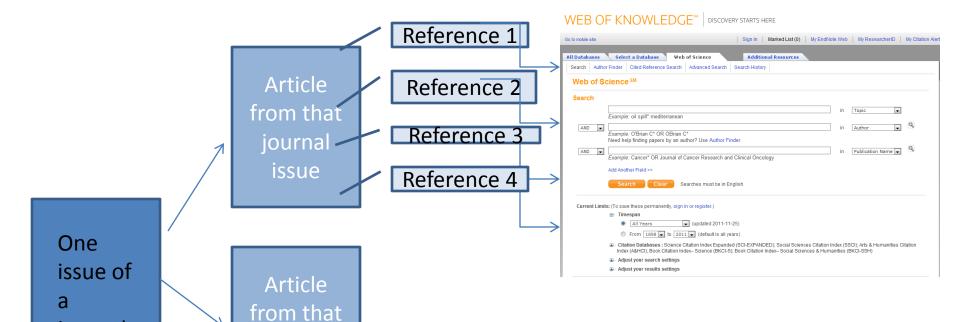
*AM PSYCH ASS, 2001, PUBL MAN AM PSYCH AS ADAIR JG, 2003, V58, P15, AM PSYCHOL AKSNES DW, 2003, V56, P235, SCIENTOMETRICS BOOR M, 1982, V37, P975, AM PSYCHOL

GOTTFREDSON SD, 1978, V33, P920, AM PSYCHOL LAWRENCE PA, 2003, V422, P259, NATURE MCGARTHY C, 2000, V5, P1, CURRENT RES SOCIAL P MOED HF, 1999, V46, P575, SCIENTOMETRICS

Social SciSeurth(R)(Dialog® File 7) (c) 2004 But for Sci Info. All rights received.

This is not meant to be a session on Web of Science, but

- Spelling variations are problematic. They use a standardized list of abbreviations but the citation is only as good as the article they are analyzing.
- Errors in citing articles' citations are perpetuated.
- The increasing role of unpublished working papers articles that may not be indexed by WoS.



journal

journal

issue

Article

from that

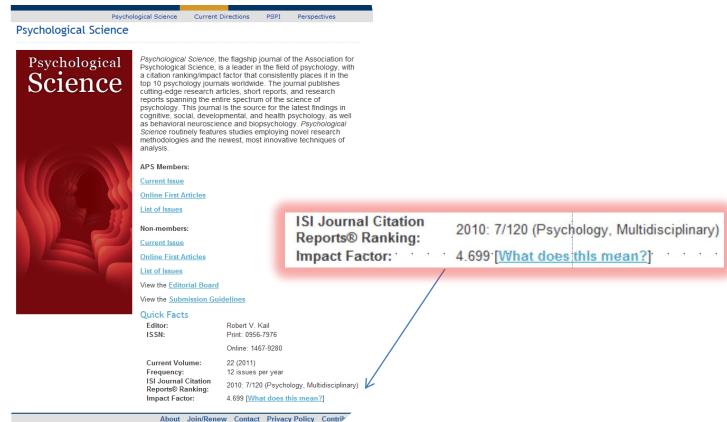
journal

issue

The reference list is used to compute the impact factor for the journals cited in the reference list, not the journal that the article came from (unless they're the same).

From Times Cited to the Impact Factor

- The counts of Times Cited becomes the basis for the Impact Factor. Web of Science citations are compiled in a related database called Journal Citation Reports (JCR). The impact factors are available in JCR.
- The Impact Factor seems to have taken on a life of its own, from a very simple number to a oft-cited (pun intended) badge of honor.



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Impact factor bragging rights

Impact Factor

- The Impact Factor is a an attempt to measure the impact a journal has had
- It is designed to "scale" the number of times a journal has been cited
- The older an article is, the more opportunities it has to have been cited.
- Some disciplines have more people working in them (child psychology vs. demography; surgery vs. mycology)

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Human Fertility

Human Fertility now indexed by ISI

Dear Colleagues,

Informa Healthcare is pleased to announce that Human Fertility is now indexed by ISI and will receive its first Impact Factor in 2012!

Human Fertility is a leading international, multidisciplinary journal dedicated to furthering research and promoting good practice in the areas of human fertility and infertility. Topics included span the range from molecular medicine to healthcare delivery, and contributions are welcomed from professionals and academics from the spectrum of disciplines concerned with human fertility.



Editor-in-Chief: Professor Henry Leese University of Hull, UK

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Two-thirds of Wiley-Blackwell's Journal F Impact Factor

SEARCH PRESS RELEASES

SEARCH

June 29, 2010



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Two-thirds of Wiley-Blackwell's Journal Portfolio now has an Impact Factor

Hoboken, N.J.

Wiley-Blackwell, the scientific, technical, medical, and scholarly business of John Wiley & Sons, Inc., today announced that two thirds of its journals (67% and 1,013 titles) have an Impact Factor according to the Thomson ISI® 2009 Journal Citation Reports (JCR). This is a higher proportion of the list than any other major journals publisher. Of these ranked titles, nearly a quarter are in the top ten of their subject category (332 titles) whilst two thirds are in the top half of their category.



ISI Web of Knowledge™

Journal Citation Reports® RETURN TO ■ WELCOME ? HELP 2010 JCR Social Science Edition Journal: FUTURE OF CHILDREN 5-Year **Impact** Citable Cited Citing **Impact** Mark **Journal Title ISSN Total Cites** Factor Factor **Immediacy Index Items** Half-life Half-life **FUTURE CHILD** 1054-8289 968 1.535 4.213 0.500 18 7.5 <u>5.7</u> Citing Journal (1) Cited Journal M Source Data Journal Self Cites RELATED JOURNALS CITED JOURNAL DATA CITING JOURNAL DATA MM IMPACT FACTOR TREND Journal Information ① Full Journal Title: FUTURE OF CHILDREN EigenfactorTM Metrics ISO Abbrev. Title: Future Child. EigenfactorTM Score JCR Abbrev. Title: FUTURE CHILD 0.00324 ISSN: 1054-8289 Article InfluenceTM Score Issues/Year: 3 1.775 Language: ENGLISH Journal Country/Territory: UNITED STATES Additional Links Publisher: PRINCETON UNIV GO TO ULRICH'S Publisher Address: 277 WALLACE HALL, PRINCETON, NJ 08544 Subject Categories: FAMILY STUDIES SCOPE NOTE VIEW JOURNAL SUMMARY LIST | WIEW CATEGORY DATA HEALTH POLICY & SERVICES [SCOPE NOTE VIEW JOURNAL SUMMARY LIST W VIEW CATEGORY DATA SOCIAL SCIENCES, INTERDISCIPLINARY SCOPE NOTE VIEW JOURNAL SUMMARY LIST WIEW CATEGORY DATA Journal Rank in Categories: Journal Ranking Journal Impact Factor ① Cites in 2010 to items published in: 2009 =9 Number of items published in: 2009 =26 2008 = 572008 = 17Sum: 66 Sum: 43 Calculation: Cites to recent items 66 = **1.535** Number of recent items

Computing Journal Impact Factor

Journal Impact Factor 🛈

Cites in 2010 to items published in: 2009 =9 Number of items published in: 2009 =26

2008 = 57 2008 = 17

Sum: 66 Sum: 43

Calculation: Cites to recent items 66 = 1.535

Number of recent items 43

5-Year Journal Impact Factor ①

Cites in {2010} to items published in: 2009 =9 Number of items published in: 2009 =26

2008 = 57 2008 = 17

2007 = 39 2007 = 18

2006 = 181 2006 = 17 2005 = 110 2005 = 16

Sum: 396 Sum: 94

Calculation: Cites to recent items 396 = 4.213

Number of recent items 94

Journal Self Cites ①

The tables show the contribution of the journal's self cites to its impact factor. This information is also re

Total Cites	968
Cites to Years Used in Impact Factor Calculation	66
Impact Factor	1.535

Self Cites	13 (1% of 968)
Self Cites to Years Used in Impact Factor Calculation	0 (0% of 66)
Impact Factor without Self Cites	1.535

Social Science Subject Categories for Journal Citation Reports (JCR)

Anthropology

Area Studies

Business

Business, Finance

Communication

Criminology & Penology

Demography

Economics

Education & Educational Research

Education, Special

Environmental Studies

Ergonomics

Ethics

Ethnic Studies

Family Studies

Geography

Gerontology

Health Policy & Services

History

History & Philosophy Of Science

History of Social Sciences

Industrial Relations & Labor

Information Science & Library Science

International Relations

Law

Linguistics

Management

Nursing

Planning & Development

Political Science

Psychiatry

Psychology, Applied

Psychology, Biological

Psychology, Clinical

Psychology, Developmental

Psychology, Educational

Psychology, Experimental

Psychology, Mathematical

Psychology, Multidisciplinary

Psychology, Psychoanalysis

Psychology, Social

Public Administration

Public, Environmental & Occupational Health

Rehabilitation

Social Issues

Social Sciences, Biomedical

Social Sciences, Interdisciplinary

Social Sciences, Mathematical Methods

Social Work

Sociology

Substance Abuse

Transportation

Urban Studies

Women's Studies

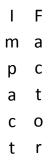
Journals are assigned to one or more categories.

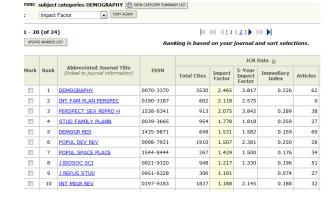
That is how the impact factor takes on bragging rights

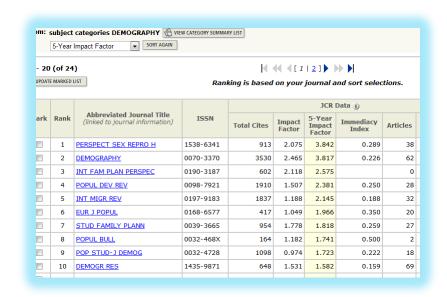
Impact factor vs. total cites for Demography Journals

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Mark	Rank		ISSN	JCR Data (j)					
		Abbreviated Journal Title (linked to journal information)		Total Cites	Impact Factor	5-Year Impact Factor	Immediacy Index	Articles	
	1	<u>DEMOGRAPHY</u>	0070-3370	3530	2.465	3.817	0.226	62	
	2	POPUL DEV REV	0098-7921	1910	1.507	2.381	0.250	28	
	3	INT MIGR REV	0197-9183	1837	1.188	2.145	0.188	32	
	4	POP STUD-J DEMOG	0032-4728	1098	0.974	1.723	0.222	18	
	5	STUD FAMILY PLANN	0039-3665	954	1.778	1.818	0.259	27	
	6	1 BIOSOC SCI	0021-9320	948	1.217	1.330	0.196	51	
	7	J ETHN MIGR STUD	1369-183X	918	1.041	1.424	0.330	97	
	8	PERSPECT SEX REPRO H	1538-6341	913	2.075	3.842	0.289	38	
	9	J POPUL ECON	0933-1433	805	0.948	1.357	0.281	57	
	10	DEMOGR RES	1435-9871	648	1.531	1.582	0.159	69	







You do the math!

- Impact factor=
 Cites to recent items
 Number of recent items
- For journals with a few articles, the impact factor is easily influenced by the number of citations
- The latency (time to get published) makes using the previous two years of citations problematic.

- All citations count in the numerator, but certain types of articles are excluded from the denominator.
- A citation counted in the numerator may be a critique of the article in questi on.

Alternatives to impact factor

- 5 year impact factor
- Eigenfactor Score[™] (see West et al., 2008)
- H-index (see Hirsch, 2005 in References)

- Calculations that may make sense in science, don't seem relevant in social science.
 - Cited half life
 - Immedicacy
 - H-factor

Sins of Omission

- One of my proudest moments at Princeton
 was when I realized that a certain journal's
 low ranking was due to a failure to send issues
 of the journal to the people who produce Web
 of Science.
- Fortunately this was before every impact factor became a household word.

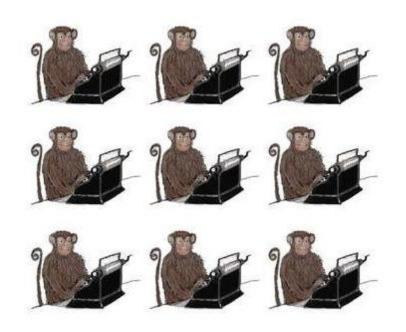
Google Scholar vs. Web of Science

- Web of Science is the rich man's Google Scholar.
- We pay more than \$100,000 for Web of Science. We have the full-blown version.
- Remember how Web of Science is created (data entry of each reference in a complete issue of a journal). Google is created much differently.

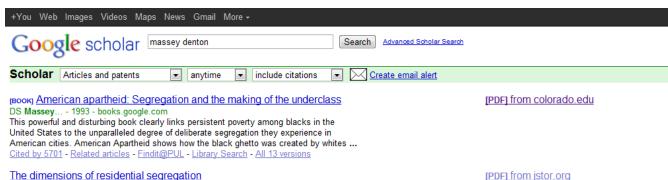
Google Scholar vs. WoS

Being indexed in Wos requires admission to the "in crowd."

Google Scholar includes everything that its robots can crawl on the internet.



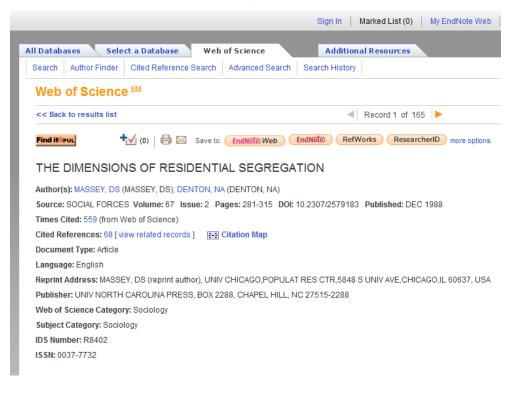




DS Massey ... - Social forces, 1988 - sf.oxfordjournals.org Abstract This paper conceives of residential segregation as a multidimensional phenomenon varying along five distinct axes of measurement: evenness, exposure, concentration, centralization, and clustering. Twenty indices of segregation are surveyed ... Cited by 1164 - Related articles - Findit@PUL - All 7 versions

> Complete citation analysis requires both GS and WoS

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Citation indices			Citations to my articles								
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	Contraceptive technology RA Hatcher, J Trussell, AL Nelson PDR Network							1132	2008		
	Contraceptive failure in the United States: a critical review of the literature J Trussell, K Kost Studies in Family Planning 18 (5), 237-283								1987		
	Age and i	nfertilit	tv								

The best way to keep track of who is citing you.

- Have a very complete copy of your publications
- Use Web of Science and Google Scholar. They will produce overlapping and unique results

"Kids, don't try this at home"--Using Web of Science

- Have a librarian help you do a Cited Reference Search in Web of Science to get citations from journals not covered by Web of Science.
- Important to search variants of name, etc.
- Create an alert to be notified when new articles that cite your work have been added.

"Kids don't try this at home"-Using Google Scholar

- Conduct a search in Google Scholar for all your publications
 - There may be multiple entries for the same article
- Create an alert in Google Scholar for all your publications
- Use Google's new Google Scholar Citations
- Depending on your discipline, use Scopus and Biosis, too.

Conclusions

 Journal Impact Factor is a very crude measure of a journal's impact in a discipline

 Do not make important decisions about submitting to a journal based on it

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