Demystifying Citation Metrics

Michael Ladisch
Pacific Libraries
Outline

• Use and Misuse of Bibliometrics
• Databases for Citation Analysis
  • Web of Science
  • Scopus
  • Google Scholar
• Journal Ranking
  • Journal Citation Reports
  • ScImago Journal Rank
• Alt-metrics
• Your Resume
Not everything that can be counted counts, and not everything that counts can be counted.

William Bruce Cameron (1963) “Informal Sociology: A Casual Introduction to Sociological Thinking”
Bibliometrics

... is a set of methods to quantitatively analyze academic literature.

**Metrics are one indicator used for**
- Evaluation of research by individual researcher / group / institution
- Awarding research grants
- Recruitment / Promotion
- Discovering relevant publications
- Finding relevant journals

**Be aware**
- Measuring “Impact” not “Quality”
- Works better in some disciplines than in others
- Metrics are not the “whole picture”, no replacement for peer review
Bibliometrics

**Primary metrics**:  
- Number of publications  
- Number of citations received  
- Collaborations  
- Weighted Impact

**Secondary metrics**:  
- Journal Impact Factor  
- H-Index

**Types of metrics**:  
- Journal metrics  
- Author metrics  
- Article metrics  
- Alt-metrics
Many reasons for citing

• Acknowledge published or unpublished sources
• Highlight other sources
• Criticize other sources (negative citations)
• Self-citations
• “Strategic citations”
  • Citation networks
  • Publications in same journal/by same publisher
Number of Authors / Contribution to publication

- Single author vs. multiple authors
- Position in author listing

Bibliometrics
Bibliometrics

Citation = Citation?

<table>
<thead>
<tr>
<th>Document types</th>
<th>Location in publication</th>
<th>Number of occurrences</th>
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<tbody>
<tr>
<td>• Book</td>
<td>• Introduction</td>
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<tr>
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<td>• Review</td>
<td>• Methods</td>
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<tr>
<td>• Article</td>
<td>• Results</td>
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<td>• Editorial</td>
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<td>• Note</td>
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<tr>
<td>• Letter to editor</td>
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<tr>
<td>• Correspondence</td>
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Bibliometrics

Citation = Citation?

Publication Year

Bibliometrics

Citation = Citation?

Discipline

http://www.harzing.com/data_metrics_comparison.htm#indivh
The Controversy

"Quantitative evaluation should support qualitative, expert assessment."

http://www.nature.com/news/bibliometrics-the-leiden-manifesto-for-research-metrics-1.17351
The Controversy

San Francisco

DORA

Declaration on Research Assessment

http://www.ascb.org/dora/
H Index

my H-INDEX is bigger than yours
H-Index

Aims to capture both productivity (output) and impact (citations)

How many $h$ of a researcher’s publications have at least $h$ citations each.
The h index is …

Pro

- Considering productivity and impact
- Comprehensible
- Easy to compute

Contra

- Not taking subject differences in account
- Disadvantaging early career researchers
- Distinguishing between single and multi-author articles
The Tools

- Scopus (Elsevier)
- Web of Sciences (Clarivate)
- Google Scholar
- Publisher Databases
The Tools

Web of Science Vs. Scopus Coverage

Source: JISC [http://adat.crl.edu](http://adat.crl.edu)
This author's h-index is 13

The h-index is based upon the number of documents and number of citations.

Note: Scopus is in progress of updating pre-1996 cited references going back to 1970. The h-index might increase over time.
Molecular and mechanical properties of major ampullate silk of the black widow spider, Latrodectus hesperus
# Google Scholar Citations

Marcos Gridi-Papp

University of the Pacific
animal communication, auditory physiology, vocal physiology, amphibia, bioacoustics
Verified email at pacific.edu - Homepage

<table>
<thead>
<tr>
<th>Title</th>
<th>Cited by</th>
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<tr>
<td>SoundRuler: acoustic analysis for research and teaching</td>
<td>98 *</td>
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<td>M Gridi-Papp</td>
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<td>Animal communication: complex call production in the túngara frog</td>
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<td>M Gridi-Papp, AS Rand, MJ Ryan</td>
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<td>Nature 441 (7089), 38-38</td>
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<td>Pure ultrasonic communication in an endemic Bornean frog</td>
<td>38</td>
<td>2009</td>
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<td>VS Arch, TU Grafe, M Gridi-Papp, PM Narins</td>
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<td>PLoS One 4 (4), e5413</td>
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<tr>
<td>Active control of ultrasonic hearing in frogs</td>
<td>26</td>
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<td>Proceedings of the National Academy of Sciences 105 (31), 11014-11019</td>
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<td>Differential fruit consumption of two Melastomataceae by birds in Serra da Mantiqueira, southeastern Brazil</td>
<td>18</td>
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<td>CO Gridi-Papp, M Gridi-Papp, WR Silva</td>
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<td>Ararajuba, 5-10</td>
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Citation indices

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<td>6</td>
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<td>i10-index</td>
<td>6</td>
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Journal Metrics
### Journal Citation Reports – Journal Impact Factor

- **55 Subject categories**
- **Uses Web of Science dataset**
- **Calculates 2 years period**

<table>
<thead>
<tr>
<th>Selected Journals</th>
<th>Add Journals to New or Existing List</th>
<th>Customize Indicators</th>
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<tbody>
<tr>
<td><strong>Journal Titles Ranked by Impact Factor</strong></td>
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<tr>
<td><strong>Full Journal Title</strong></td>
<td><strong>Total Cites</strong></td>
<td><strong>Journal Impact Factor</strong></td>
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<tr>
<td>Physics of Life Reviews</td>
<td>1,327</td>
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<td>BIOLOGICAL REVIEWS</td>
<td>9,669</td>
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<td>PLOS BIOLOGY</td>
<td>26,893</td>
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<td>eLife</td>
<td>15,730</td>
<td>7.725</td>
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<td>BMC BIOLOGY</td>
<td>4,588</td>
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<td>PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES</td>
<td>36,908</td>
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<tr>
<td>FASEB JOURNAL</td>
<td>42,242</td>
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# Journal Citation Reports – Journal Impact Factor

## Key Indicators

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<th>Year</th>
<th>Total Cites</th>
<th>Journal Impact Factor</th>
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<td>2016</td>
<td>26,893</td>
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<tr>
<td>2015</td>
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<td>2013</td>
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<td>2012</td>
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<td>2011</td>
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<td>2007</td>
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<td>13.501</td>
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SCImago Journal & Country Rank

- 27 Subject areas and 313 Subject categories
- Uses Scopus dataset
- Calculates 3 years period

http://www.scimagojr.com
<table>
<thead>
<tr>
<th>Title</th>
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<th>SJR</th>
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<th>Total Docs. (3yrs)</th>
<th>Total Refs.</th>
<th>Total Cites (3yrs)</th>
<th>Citable Docs. (3yrs)</th>
<th>Cites / Doc. (2yrs)</th>
<th>Ref. / Doc.</th>
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<td>Studies in Mycology</td>
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<td>Plant Cell</td>
<td>journal</td>
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<td>5.516</td>
<td>289</td>
<td>216</td>
<td>1075</td>
<td>12092</td>
<td>8190</td>
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**Scopus - CiteScore**

**Source details**

**Plant Cell**
Scopus coverage years: from 1989 to Present
Publisher: American Society of Plant Biologists
ISSN: 1040-4651  E-ISSN: 1532-298X
Subject area: Agricultural and Biological Sciences: Plant Science

**Visit Scopus Journal Metrics**

- **CiteScore 2016**
  - 7.66
- **SJR 2016**
  - 5.516
- **SNIP 2016**
  - 2.102

**CiteScore**

- **2016**
  - 7.66
  - Citation Count 2016
    - 8,241 Citations
  - Documents 2013 - 2015*
    - 1,076 Documents

* CiteScore includes all available document types

Calculated on 23 May, 2017

**CiteScore rank**

In category: Plant Science

Percentile: 98th
Rank: 5379
Altmetrics
Altmetrics

"Altmetrics are measures of scholarly impact mined from activity in online tools and environments.”

Jason Priem, author of “Altmetrics: a manifesto”

Benefits:
• A more nuanced understanding of impact, showing us which scholarly products are read, discussed, saved and recommended as well as cited.
• Often more timely data, showing evidence of impact in days instead of years.
• A window on the impact of web-native scholarly products like datasets, software, blog posts, videos and more.
• Indications of impacts on diverse audiences including scholars but also practitioners, clinicians, educators and the general public.

New perspectives of impact

ACADEMIC IMPACT

- Journal Impact Factor
- Citation counts
- H-index
- Number of publications

Traditional bibliometrics

SOCIETAL IMPACT

- Download counts
- Page views
- Mentions in news reports
- References in policy
- Mentions in social media
- Mentions in blogs
- Reference manager readers
- ... etc.

Alternative metrics “altmetrics”

Can be slow to accrue
Potentially “measured”

- Viewed (publisher websites, Dryad)
- Downloaded (publisher websites, Slideshare, Dryad)
- Shared (Facebook, Twitter)
- Reused/adapted (Github)
- Bookmarked (Mendeley, CiteULike, Delicious)
- Purchased (Library catalogues, Sales numbers)
- Commented upon (Twitter, Mendeley, blogs, publisher websites, Wikipedia, Faculty 1000)
Altmetrics

Caveats

- Lack of standard
- Use of online tools may differ by individual researcher, discipline, over time
- Popularity (attention) does not always equal quality of research or researcher
- Was the spike in hits a one-time, short-attention event?
- Data sources come and go (think MySpace, Connotea)
- Open to manipulation and gaming
Altmetrics - Impactstory

http://impactstory.org/
The timing and spatiotemporal patterning of Neanderthal disappearance.

Citation data: Nature, ISSN: 1476-4687, Vol: 512, Issue: 7514, Page: 306-9
Publication Year: 2014
Your Resume

To include in your CV

- Books
- Book chapters
- Journal articles
- Conference papers
- Working papers
- Patents
- Government publications

Count and mention

- Number of citations
- Impact factor of journal
- Your h-Index
- Downloads/views from Repository
- Reviews of book or book chapter
Your Resume

Include also

- Datasets / Open Source Software (download statistics)
- Awards (best paper award etc.)
- Reviewing invitations (journals, conferences)
- Editorial board membership
- Interviews, public appearances
- Scholarly articles in newspapers/magazines
- Links to professional blogs and professional accounts in social media (Twitter, Facebook, ResearchGate, Academia.edu, LinkedIn, etc.)
Your Resume

Add Summary for Publications

**Summary:** Since 2004 I have published 21 peer-reviewed journal articles (18 as first/corresponding author) and 3 book chapters. I have an h-index of 6 as calculated using Web of Science or 7 as calculated using Google Scholar. The following lists ISI Impact Factors and citations according to Google Scholar.

**Peer-Reviewed Journal Articles (published or accepted for publication):**


**Research Publications (listed earliest to latest):**

- ISI Thompson H-index (all journal publications = 6; research publications = 5)
- Google Scholar H-index (all journal publications = 7; research publications = 5)
- 16 original articles (authorship: 10 first, 4 senior, 1 second, 1 other)
- 29 abstracts (authorship: 25 first, 1 senior)
Internet downloads

- 75,000 page downloads from my home page in 2009.
- Over 10,000 hits on INFFER web pages in 2009
- Most downloaded paper in *Australian Journal of Experimental Agriculture* since 2000 – effectively the all time most downloaded paper out of 1300 published in that time (have been no. 1 since May 2008 to present): Pannell, Marshall, Barr, Curtis, Vanclay and Wilkinson (2006).
- 17th most downloaded paper of all time in *Australian Journal of Experimental Agriculture*: Ridley and Pannell (2005).
Thank you!

Feel free to attend other Scholarly Communication Talks
For schedule see: http://scholarlycommons.pacific.edu/plw/

And check out the workshops provided by:
Office of Sponsored Programs
Institutional Review Board
Graduate School
Center for Teaching and Learning

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ORCID: http://orcid.org/0000-0002-0124-5582