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# New forms of scholarly communication and altmetrics

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#### **Scholarly communication**

encompasses all communicative activities of scholars, including **formally** publishing and citing articles in scientific journals and **informally** discussing research and sharing research outputs on various forums.





Peer-reviewed **Scientific journals** (in the beginning published often by scientific societies) replaced earlier personal correspondences and became the platform for **dissemination** and **registration of one's contribution to science**.



Journal de Sçavans and Philosophical Transactions in 1665

#### Increase in scientific publishing: example case arXiv

#### arXiv.org > stats

#### arXiv monthly submission rates [CSV]



<u>https://arxiv.org/</u> Open access to 1,300,901 e-prints in Physics, Mathematics, Computer Science, Quantitative Biology, Quantitative Finance and Statistics

#### **Citation index**

"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."

Garfield, E. (1955). Citation indexes for science. A new dimension in documentation through association of ideas. *Science*, 122, 108-111.

**Eugene Garfield** founded the Institute for Scientific Information (ISI) in 1960. It is now known as Clarivate Analytics. **Web of Science**, an online scientific citation indexing service, is part of it.





### Bibliometrics

"the study of quantitative aspects of the production, dissemination, and use of recorded information"

The research field develops mathematical models and measurements for these processes that can be used for prognoses of the future and to support decision making

Tauge-Sutcliffe, J. (1992): An Introduction to Informetrics. *Scientometrics*, 28(1), p. 1-3.

### Number of records about **bibliometrics** indexed by Web of Science



### **Sociology of Science**

"Instrumentally, it [the reference] tells us of work we may not have known before, some of which may hold further interest for us; symbolically, it registers in the enduring archives the intellectual property of the acknowledged source by providing a pellet of peer recognition of the knowledge claim, accepted or expressly rejected, that was made in that source."

Merton, R. K. (1988). The Matthew effect in science, II: Cumulative advantage and the symbolism of intellectual property. *Isis*, 79, 606–623.



**Scientometrics** 

Movember 2014, Volume 101, <u>Issue 2</u>, pp 1027–1042 | <u>Cite as</u>

## Disciplinary differences in Twitter scholarly communication





#### Journal Impact Factor is the yearly

average number of citations to recent articles published in that journal. It is used as a proxy for the relative importance of a journal within its field.

However, the term "impact factor" has gradually evolved to describe both journal and author impact...





#### The *h* index

"I propose the index h, defined as the number of papers with citation number >= h, as a useful index to characterize the scientific output of a researcher."

Hirsch, J.E. (2005). An index to quantify an individual's scientific research output. Proceedings of the National Academy of Sciences of the United States of America, vol. 102, no. 46, pp. 16569-16572.



There are, however, a number of situations in which *h* may provide misleading information about a scientist's output!



Career pressure may lead to scientific misconduct, including fabrication, falsification, and plagiarism, but also to other adverse effects, such as selfcitations, "salami slicing", citation cartels, and others.









# Altmetrics

the study and use of scholarly impact measures based on activity in online tools and environments

Priem, J. (2014). Altmetrics. In Cronin, B. & Sugimoto, C.R. (Eds.). *Beyond Bibliometrics: Harnessing Multidimensional Indicators of Scholarly Impact*. MIT Press, 2014.

"...altmetrics presents an alternative to the current practice of relying only on citation counts and journal impact factors for the quantitative analysis of impact by introducing **new complementary approaches and sources of data**."



Results: 634 (from Web of Science Core Collection)	Sort by: Date Times Cited ↓ Usage Count Relevance More ▼	<ul> <li>▲ 1 of 64 ▶</li> </ul>
You searched for: ORGANIZATION- ENHANCED: (university of tuzla) More	Select Page C+ Export Add to Marked List	Analyze Results
🌲 Create Alert	1.       HPV Involvement in Head and Neck Cancers: Comprehensive Assessment of Biomarkers in 3680 Patients         By: Castellsague, Xavier; Alemany, Laia; Quer, Miquel; et al.	Times Cited: 181 (from Web of Science Core Collection)
Refine Results	Group Author(s): ICO Int HPV Head Neck Canc Study JNCI-JOURNAL OF THE NATIONAL CANCER INSTITUTE Volume: 108 Issue: 6 Article Number: djv403 Published: JUN 2016	Thighly Cited Paper
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·	2. Chronic kidney disease and cardiovascular risk in six regions of the world (ISN-KDDC): a cross-sectional study	Times Cited: 73 (from Web of Science Core
Filter results by:	By: Ene-Iordache, Bogdan; Perico, Norberto; Bikbov, Boris; et al.	Collection)
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Hot Papers in Field (1)	G Linkit d Free Full Text from Publisher View Abstract ▼	
Open Access (225)	3. Strokes in young adults: epidemiology and prevention	Times Cited: 60 (from Web of Science Core
Refine	By: Smajlovic, Dzevdet VASCULAR HEALTH AND RISK MANAGEMENT Volume: 11 Pages: 157-164 Published: 2015	Collection)
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Web of Science Categories	By: Ahmetovic, Elvis; Ibric, Nidret; Kravanja, Zdravko; et al. COMPUTERS & CHEMICAL ENGINEERING Volume: 82 Pages: 144-171 Published: NOV 2 2015	Usage Count ~
ECONOMICS (78) SYCHIATRY (47)	G Linkit Full Text from Publisher View Abstract ▼	

52

212 Mendeley





Mentioned by

Citations

Readers on

11 tweeters

3 Facebook pages

2 Wikipedia pages

59 Dimensions

313 Mendeley

#### About this Attention Score

Average Attention Score compared to outputs of the same age

Mentioned by

2 tweeters

Citations

MORE...

47 Dimensions

Readers on

73 Mendeley



# Possibilities with altmetrics





Altmetrics events are generated quickly after publication (in contrast to citations)

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Altmetrics can (possibly) reflect different types of impact, such as impact on health, culture, education, econ omy, and environment, and different levels of impact or engagement.





## Early Mendeley readers correlate with later citation counts

Mike Thelwall<sup>1</sup>

#### "Mendeley reader counts are more useful early impact indicators than citation counts"

#### Altmetrics can be used to map how researchers are engaging with the public (and other researchers)

Holmberg, K., Bowman, T.D., Haustein, S., & Peters, I. (2014). Astrophysicists' Conversational Connections on Twitter. PLoS ONE, vol. 9, no. 8: e106086. DOI:10.1371/journal.pone.0106086.

Robinson-Garcia, van Leeuwen, & Ràfols (2017). Using altmetrics for contextualised mapping of societal impact: from hits to networks. SSRN. Available at: <u>https://papers.ssrn.com/sol3/papers.cfm?abstract\_id=2932944</u>



## Astrophysicists on Twitter – results from two studies

Holmberg, K., Bowman, T.D., Haustein, S., & Peters, I. (2014). Astrophysicists' Conversational Connections on Twitter. *PLoS ONE*, vol. 9, no. 8: e106086. DOI:10.1371/journal.pone.0106086. Available at: <u>http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0106086</u>.

Haustein, S., Bowman, T.D., Holmberg, K., Larivière, V., & Peters, I. (2014). Astrophysicists on Twitter: An in-depth analysis of tweeting and scientific publication behavior. *Aslib Journal of Information Management*, vol. 66, no. 3, pp. 279-296. DOI:10.1108/AJIM-09-2013-0081. Available at: <a href="http://www.emeraldinsight.com/doi/abs/10.1108/AJIM-09-2013-0081">http://www.emeraldinsight.com/doi/abs/10.1108/AJIM-09-2013-0081</a>.

# Communities of attention and conversational networks





## **Discussion topics**



### **Astrophysicists on Twitter**



Publications and tweets per day: -0,339\* Citation rate and tweet per day: -0,457\*\*

## Challenges with altmetrics



## Coverage by platform



Haustein S, Costas R, Larivière V (2015) Characterizing Social Media Metrics of Scholarly Papers: The Effect of Document Properties and Collaboration Patterns. PLoS ONE 10(3): e0120495. https://doi.org/10.1371/journal.pone.0120495

#### **Data issues**



Issues with replicability

Issues with consistency (between data providers) Dependence on APIs and DOIs Dependence on data providers

### Altmetrics are easily manipulated



Haustein, S., Bowman, T.D., Holmberg, K., Tsou, A., Sugimoto, C.R. & Lariviére, V. (2015). Tweets as impact indicators: Examining the implications of automated "bot" accounts on Twitter. *JASIST*. arXiv version available at: http://arxiv.org/ftp/arxiv/papers/1410/1410.4139.pdf.

The **meaning and applicability** of altmetrics generated on different platforms is still **unclear** 



## **Goodhart's Law:**

# When a measure becomes the target, it ceases to be a good measure

Goodhart, 1975



## **Altmetrics are easily manipulated!**

# Researchers and social media



## Why researchers should use social media?

- Increase visibility and impact
- Adopt and promote Open Science
- Manage your online profile
- Expand your network
- Educate yourself
- Create debate
- And perhaps even increase the chances of securing funding





#### Assessment criteria

26. Each sub-panel will examine the submissions made in its UOA, taking into account all the evidence presented. They will use their professional judgement to form an overall view about each submission. In doing so, the sub-panels will assess three distinct elements of each submission, against the following generic criteria:

- a. **Outputs:** The sub-panels will assess the quality of submitted research outputs in terms of their 'originality, significance and rigour', with reference to international research quality standards. This element will carry a weighting of **60 per cent** in the overall outcome awarded to each submission.
- b. Impact: The sub-panels will assess the 'reach and significance' of impacts on the economy, society, culture, public policy or services, health, the environment or quality of life that were underpinned by excellent research conducted in the submitted unit. This element will carry a weighting of 25 per cent.
- c. **Environment:** The sub-panels will assess the research environment of the submitted unit in terms of its 'vitality and sustainability', including the approach to enabling impact from its research, and its contribution to the vitality and sustainability of the wider discipline or research base. This element will carry a weighting of **15 per cent**.

Build and manage your online profile, and with that, your online reputation

MENDELEY

Google
Score
Coople
ResearchGate
Coople
Coople
Coople





and social media. ... Google Books

Future, MORE

Books: Altmetrics for Information Professionals: Past, Present and

**Holmberg**, **Kim** (2011). Den första ISSOME-konferensen. Informaatiotutkimus, vol. 30, no. 3-4. Available online athttp://ojs.tsv.fi/index.php/inf/article/view/4703.

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#### https://www.utu.fi > people > kim-holmberg - Translate this page

My research interests include scholarly communication (in social media), webometrics, altmetrics, scientometrics, social network analysis, and online information ...

Feedback





Engage in a community and with the public and expand your network



## But let's not forget traditional media





## Hvala vam na pažnji

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TOM GAULD











