

Open Science Coffee Lectures



Let's publish! Bibliometry – h-index, impact factor and more

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What does bibliometrics measure?

- Who
- When
- How often
- By whom

Publications

- in a journal
- of an author/institution

Single publications



are cited

Scientific Impact



Bibliometric indicators

Journals

e.g. Journal Impact
Factor

People, Institutions

e.g. h-index

Articles

e.g. Altmetrics,
article level metrics

Journal indicators – example: **Journal Impact Factor (JIF)**

- Database: Web of Science (WoS): only journals referenced in WoS have a JIF.
- calculated yearly
- published in Journal Citation Reports (JCR)

Example: *American Economic Journal: Macroeconomics*

Journal Impact Factor™ is calculated using the following metrics:

$$\frac{\begin{array}{c} \text{Citations in 2021 to items published in 2019} \\ \text{(334) + 2020 (190)} \end{array}}{\begin{array}{c} \text{Number of citable items in 2019 (40) + 2020} \\ \text{(38)} \end{array}} = \frac{524}{78} = 6.718$$

Journal Impact Factor (JIF): use carefully!

JIF depicts a mean for an entire journal

- Not a statement about the quality of a single article
- Mean is strongly influenced by outliers.

Subject-specific citation habits

- Comparison only for journals on the same subject

Some journals „do exceptionally well“

- Interdisciplinary journals
- Review journals
- „brand name“

DFG Code of Conduct

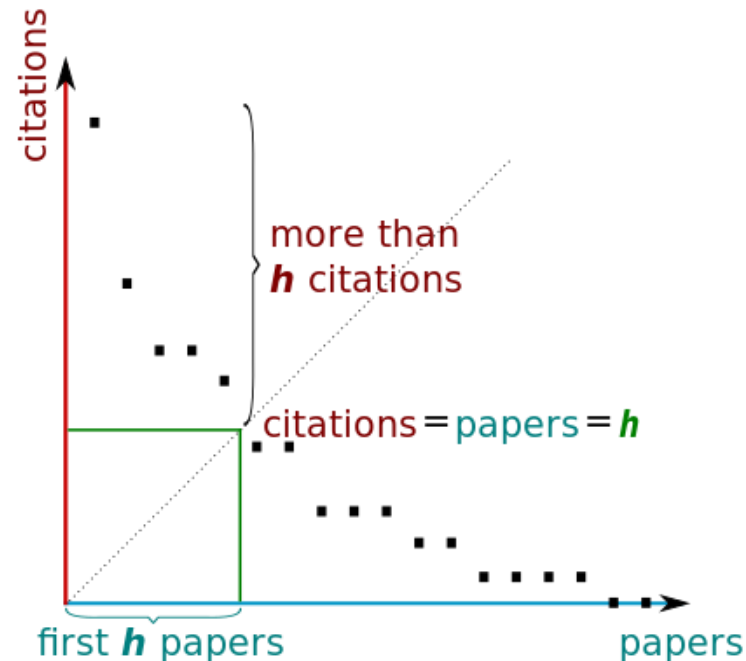
“Guidelines for Safeguarding Good Research Practice” – Guideline 15 Publication medium:

The scientific/academic quality of a contribution does **not** depend on the medium in which it is published.

Author indicators – example: **h-index**

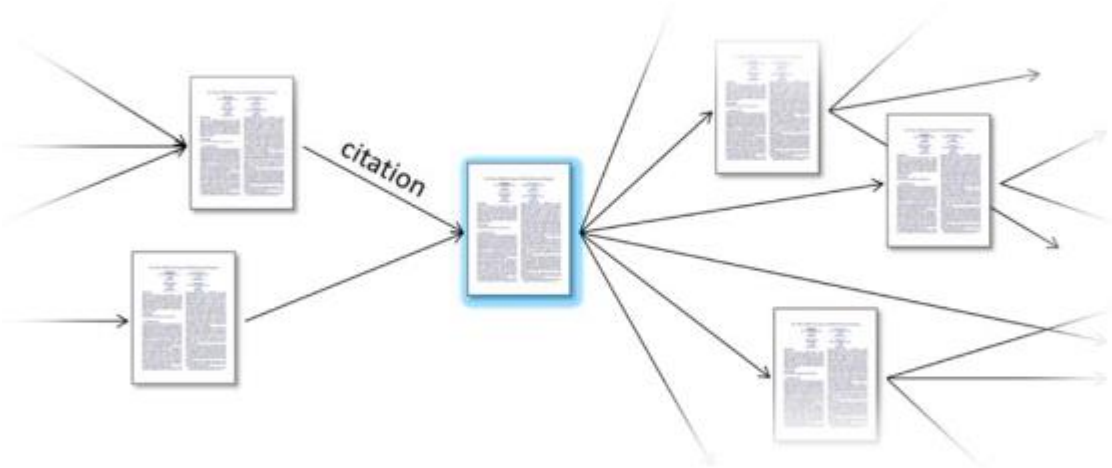
- Describes the scientific output of an author.
- Can be retrieved from citation databases (e.g. WoS, Scopus, Google Scholar).
- Calculated values differ (depending on time of the analysis and database).
- Older authors are at an advantage.

Number of publications	Number of citations (highest first)
1	31
2	28
3	24
4	23
5	17
6	12
7	5
8	5
9	0



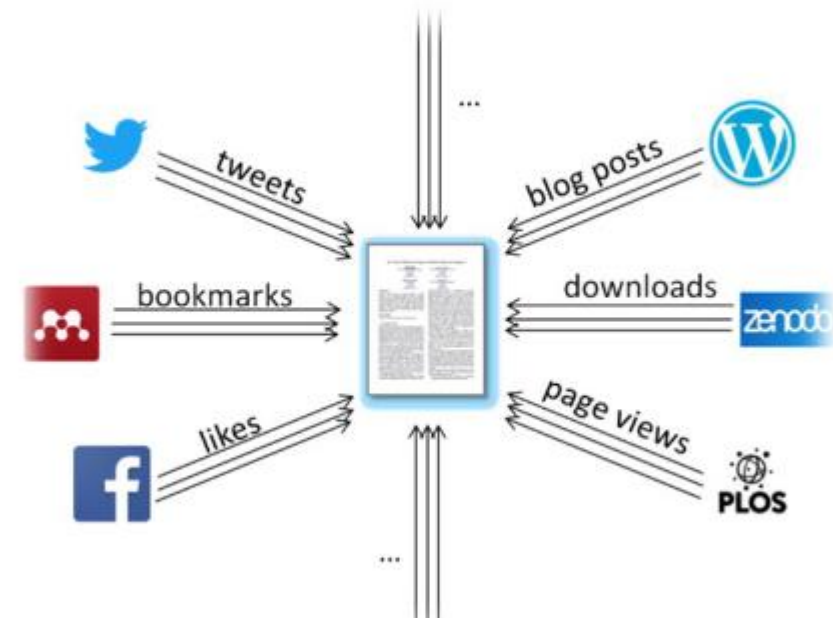
How to measure the impact of a publication?

Bibliometrics



How often is a publication cited by another scientific publication?

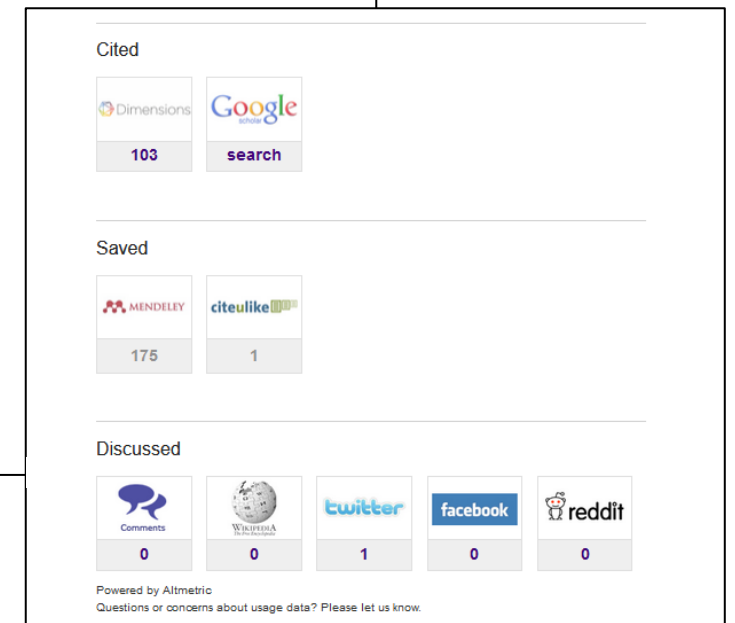
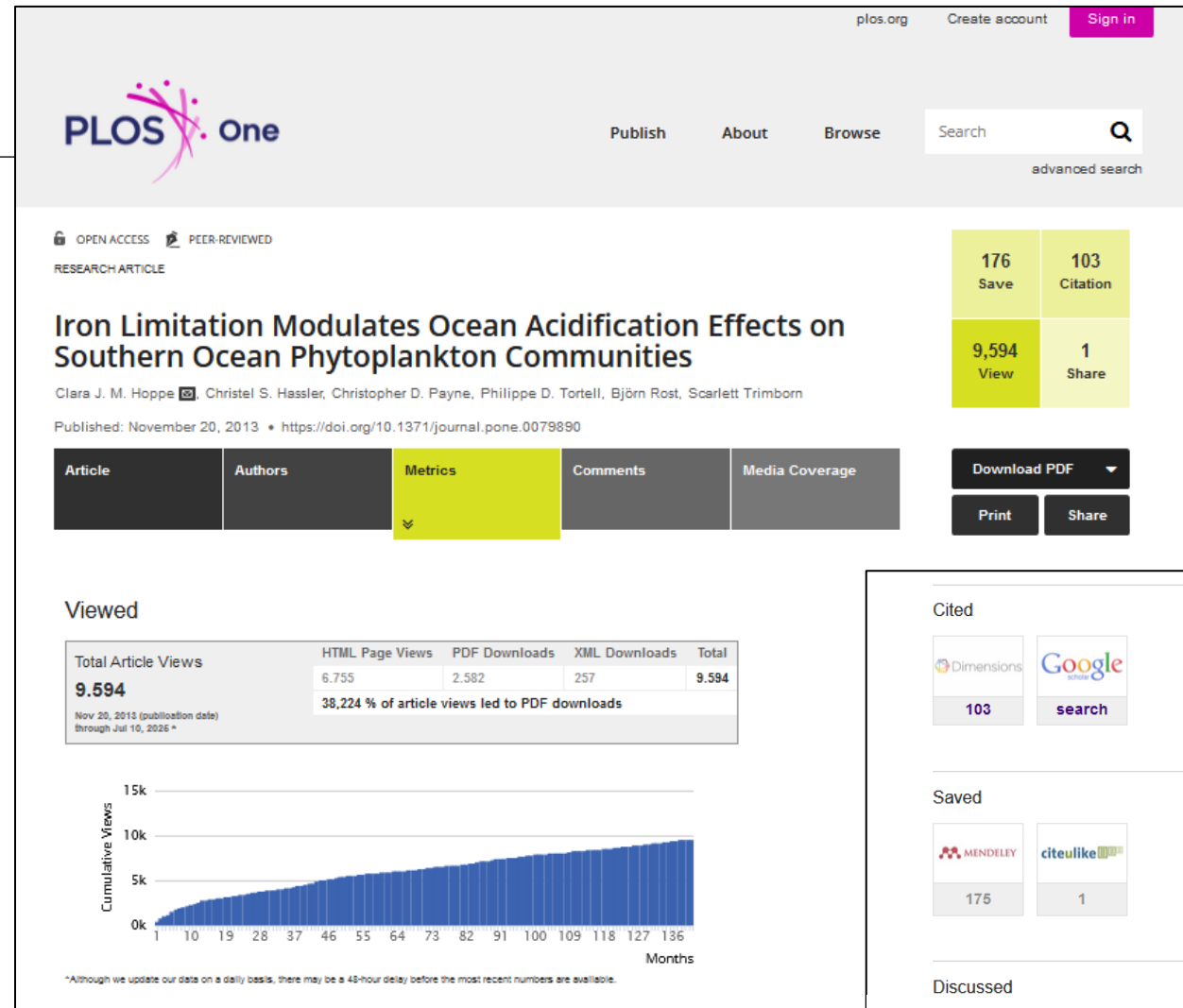
Altmetrics/usage metrics



How often do users interact with the publication online?

Article level metrics

Example PLOS ONE



Issues with bibliometric indicators

- Validity depends on the quality of the underlying database.
- Temporal delay of often several years
- Subject-specific publication and citation habits
- Depend on the scope of the sources evaluated:
 - Only English language?
 - Subjects covered?
 - Only journals or also books, conference papers,...?

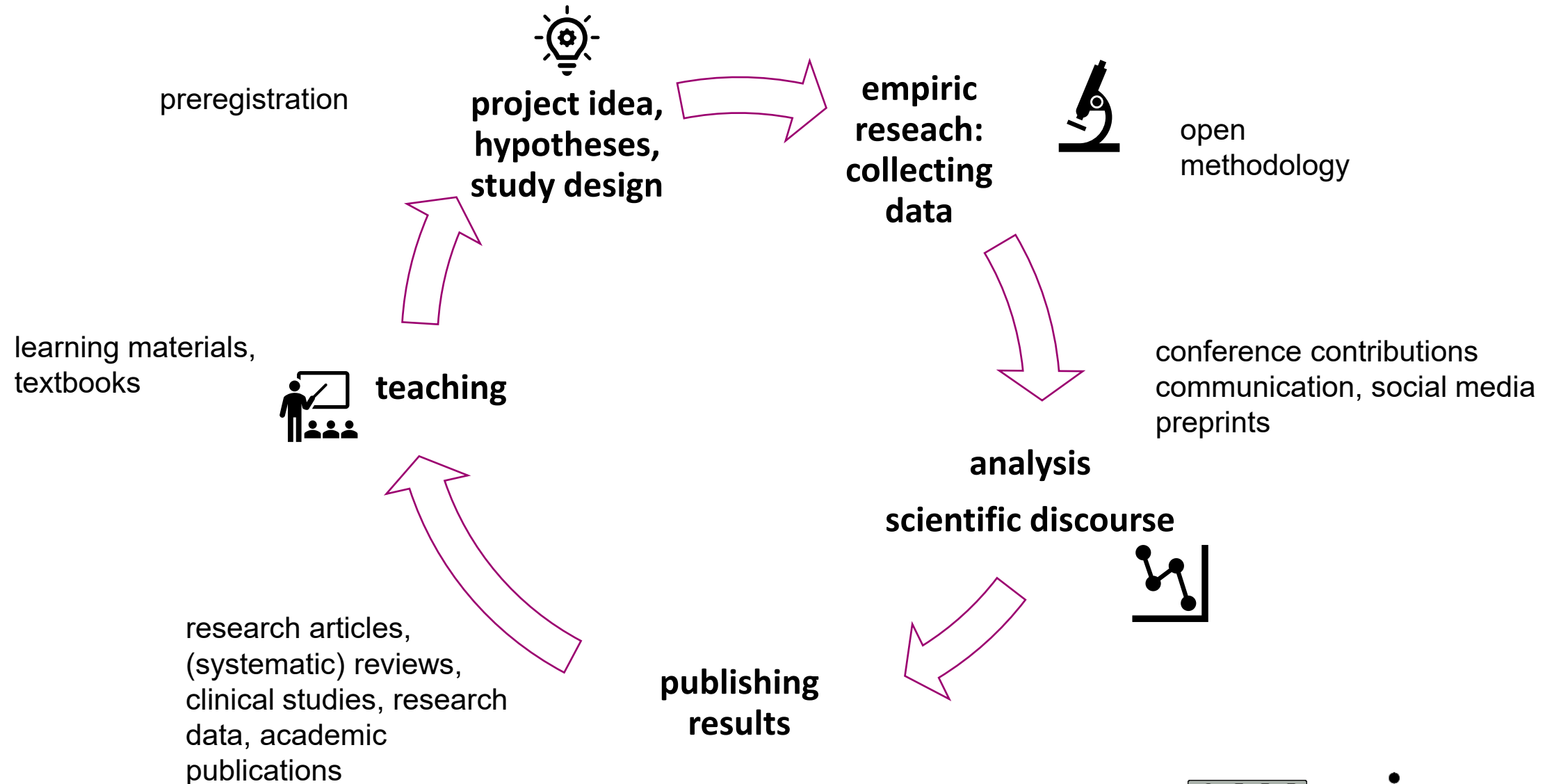
- Critique and alternative approaches:
- San Francisco Declaration
 - Leiden Manifesto



Goodhart's Law:

When a measure becomes a target it ceases to be a good measure.

Scientific impact – not only a question of journal articles



Further Information

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