

Measuring the impact of open science

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Bibliometrics?

The study of **publications** in a **quantitative** fashion

Generally very focused on journal articles & citation analysis

(because those are the things people can measure most easily...)

Increasingly used as an unchallenged marker of "quality"

(despite the obvious conceptual problems with this)

Misuse of metrics

Frequent assumptions that...

- ...articles can be described by journal metrics
- ...researchers can be described by article (journal) metrics
- ...metrics are neutral, reliable, and uncontroversial
- ...metrics are easily defined algorithms with single values
- ...that there is a single value, to three decimal places,
...which **Means Something Important**

Offender #1: the impact factor

$$\text{IF}_y = \frac{\text{Citations}_{y-1} + \text{Citations}_{y-2}}{\text{Publications}_{y-1} + \text{Publications}_{y-2}}$$

- For a long time, the only easily available metric
- Describes *journals*, not *individual papers*
- Effectively impossible to compare across fields
- Often treated as single "magic number"
- Widely misunderstood, widely misused



Clearly, this is *the* most important thing to know about any journal...

journal of neuroscience



journal of neuroscience

journal of neuroscience **impact factor**

journal of neuroscience **methods**

journal of neuroscience **research**

journal of neuroscience **abbreviation**

journal of neuroscience **nursing**

journal of neuroscience **reference style**

journal of neuroscience **psychology and economics**

journal of neuroscience **submission**

journal of neuroscience **instructions for authors**

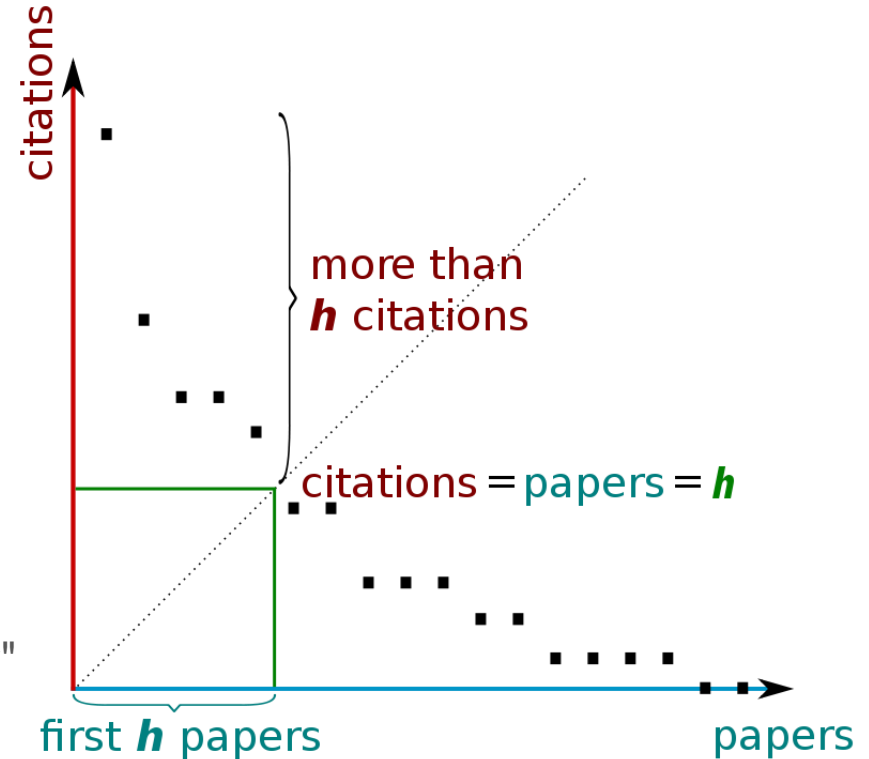
Google Search

I'm Feeling Lucky

Report inappropriate predictions

Offender #2: the h-index

- Describes authors (not papers)
- Directly relates to age/career status
- Highly dependent on field
- Continues to increase indefinitely (even after death/retirement)
- Often treated as single "magic number"



Offender #3: assumption of universality

- Bibliometrics ultimately measures publications, but every field has distinctive publication practices (often unknown to outsiders) which makes them difficult to compare
- Hidden assumptions about data sources & cut-offs can dramatically alter results
- Different services draw on different data for different conclusions
- Metrics presented as single "magic numbers" conceal all of this

So why count citations at all?

- "Quality" is contested and shifting, but citations can tell us something such as "interest" or "attention" of the scholarly community
 - of course, that attention can be strongly negative!
- General overall correlations between citations and other indicators such as peer review, post-facto identification of significance, etc
- More practical to deploy citation-counting at scale than anything else

And the open science problem...

- Most metrics-driven approaches rely on these assumptions of universality “we know how publishing works, it’s normal that...”
- Things like open access, preprints, etc complicate things like “publication”
- Emphasis on new publication venues challenges reliance on journal ranks
- Incentive & assessment systems built around metrics can thus *penalise* open approaches or discourage experimentation
- Emphasis on old metrics can even incentivise clearly problematic behaviour

Development of "responsible metrics"

2013 - **San Francisco Declaration on Research Assessment**

First major statement; challenged misuse of the Journal Impact Factor

2015.4 - **Leiden Manifesto for Research Metrics**

Ten principles for research measurement & evaluation, set out by experts in the field

2015.7 - **The *Metric Tide* report** (HEFCE)

HEFCE-driven review of the role of metrics in research assessment; coined (and called for) "responsible metrics"

Other approaches – “altmetrics”

- Seek to measure non-citation usage & impact
- Not all of equal validity – but sometimes of interest



Other approaches - "humane metrics"

STRATEGIC APPROACH

HuMetricsHSS takes the approach that metrics should only be used to measure a scholar's progress toward embodying five values that our initial research suggests are central to all HSS disciplines:

COLLEGIALITY, which can be described as the professional practices of kindness, generosity, and empathy toward other scholars and oneself;

QUALITY, a value that demonstrates one's originality, willingness to push boundaries, methodological soundness, and the advancement of knowledge both within one's own discipline and among other disciplines and with the general public, as well;

EQUITY, or the willingness to undertake study with social justice, equitable access to research, and the public good in mind;

OPENNESS, which includes a researcher's transparency, candor, and accountability, in addition to the practice of making one's research **OPEN ACCESS** at all stages; and

COMMUNITY, the value of being engaged in one's community of practice and with the public at large and also in practicing principled leadership.



<https://humetricshss.org/about/>

And finally...

- Thinking about metrics/assessment is important to support Open Science
- Work is under way – UCL is developing a policy on responsible metrics
- In keeping with all the major recommendations
- Focus is on setting clear lines for bad things to avoid
- Consultation will open to all staff ... very soon