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BACKGROUND

Impact metrics are calculations conceived to quantify the influence of research and scholarly activity. Quantifying research impact is a long-standing concern of researchers, research institutions and funders. The basic premise of traditional citation metrics is that counts of citation (and calculations based on these counts) are directly correlated to the scholarly impact of journals, articles, and authors. These calculations are commonly used as a major indicator for departmental reviews, tenure and promotion, funding allocations and efficacy of funding decisions, faculty hiring, as well as institutional rankings.

Citation counts and a range of other calculated indicators are included in many commercial databases. The three main providers of more extensive metrics are Thomson Reuters, Elsevier and Google. Historically the vast majority of metrics have been calculated at the level of the journal. These calculations include, e.g. Impact Factor, Eigenfactor®, SCImago Journal Rank (SJR) and h5-index. Thomson Reuters' Impact Factor has been considered the gold standard for many years.

There have been fewer metrics to measure impact at the level of the article or the author. The most com-

monly used indicator for both article and author has been citation count. For author level metrics, the h-index (see Hirsch, 2005) has gained popularity due to its ease of use and effectiveness across disciplines. Article level metrics are undergoing a transformation that has extended them beyond the traditional commercial providers. The calculation of this level of metric incorporates multiple data sources, both traditional and emerging. The data collected is not limited to calculating article level metrics but has the potential to be used to generate journal and author metrics as well.

As scholarly communication takes on new forms and moves increasingly to digital and open access venues, the value of new types of metrics is increasingly important for the research community. It is causing discussion and, in some camps, heated debate. You may want to consider if these new metrics are right for you.

SHOULD YOU BE USING THEM TO DEMONSTRATE THE IMPACT OF YOUR RESEARCH?



ALTMETRICS

Altmetrics (also referred to as alternative metrics or alt-metrics) has a relatively short history as a field of study, dating back to 2010 when the name was coined. The term itself is used to describe the emerging or newer data sources for item level metrics, e.g. Twitter, Facebook, or blogs. Where article level metrics (ALMs) refers to data collected to determine the impact of individual articles, altmetrics refers to the source of the data (e.g. a tweet), rather than the data itself (e.g. the number of times an item has been tweeted about).

Altmetrics report the impact of a wider range of research outputs, including presentation slides, data sets, articles and code. In [altmetrics: a manifesto](#), there is a good introduction to how altmetrics can enrich more traditional reflection on impact and value with spontaneous crowd-sourced peer-review and metrics from web based data sources. A more current description of the relationship between altmetrics and article level metrics can be found in [Article-Level Metrics: A SPARC Primer](#).



THE BASICS

Web based services of all types produce huge amounts of use data resulting from both scholarly and public activity. Some of this data makes reference to objects of scholarly communication – articles, books, datasets, computer programs, presentation slides, etc. Using open APIs (Application Programming Interfaces) altmetric tools/services draw data from these sources, which have been categorized as follows (as per Cave, 2012 and Tananbaum, 2013):



USAGE
(views, downloads)



CAPTURES
(bookmarks, shares)



MENTIONS
(blogged, mentioned in Wikipedia or the news sources)



SOCIAL MEDIA
(Facebook likes, shares, tweets)



CITATIONS
(Web of Science, Scopus)

DATA SOURCES

Sources that contribute data are diverse, growing in number and include commercial and not-for-profit databases (e.g. Scopus, PubMed), social networks (e.g. Facebook, Twitter), social bookmarking (e.g. CiteULike, Delicious), blogs, Wikipedia, presentation and video collections (e.g. SlideShare, YouTube), data repositories (e.g. Dryad, figshare) and citation management tools (e.g. Mendeley, Zotero).



TOOLS AND SERVICES

ALTMETRIC TOOLS MAKE USE OF UNIQUE AUTHOR AND OBJECT IDENTIFIERS (E.G. ORCID, DOI, PMID, URL) TO DISAMBIGUATE THE ITEMS ABOUT WHICH THEY ARE REPORTING.

Altmetric services package and display item level metrics and present them through plug-ins, embedded web reports and web based tools, some free for individual use while others are for profit, targeted to the institutional level. As this is a rapidly developing field, the following are a sampling of the range of companies and services available:

- **ALTMETRIC**
www.altmetric.com
- **CITEDIN**
<http://citedin.org>
- **IMPACTSTORY**
<http://impactstory.org/>
- **PLOS ARTICLE LEVEL METRICS**
<http://article-level-metrics.plos.org>
- **PLUM ANALYTICS**
<http://www.plumanalytics.com>



STRENGTHS

- **IMMEDIACY**
update quickly from social media and other sources
- **PUBLIC SECTOR CONTENT**
impact or influence of research outside scholarly community
- **BROAD FORMAT COVERAGE**
impact of digital scholarly objects, as well as traditional forms
- **DISCIPLINE NEUTRAL**



CAVEATS

- **GAMING**
impact can be exaggerated through data manipulation
- **SOCIAL MEDIA LITERACY**
interpretation of data requires knowledge of data sources
- **DATA SOURCE INSTABILITY**
inherent risk in reliance on 3rd party data sources (Howard, 2013b)
- **CITATION DATA ACCURACY**
Author name and object disambiguation is essential to the accuracy of citation data; Identifier services are not consistently used



OVERALL

Altmetrics supplement the existing range of metrics and for some researchers may provide valuable insight into public interactions with their research. Some scholarly publications and online repositories are experimenting with embedding these metrics as value-added content and to demonstrate community and/or scholarly engagement with the content.

THE IMPORTANCE OF ALTMETRICS WILL ONLY INCREASE OVER TIME AS VASTLY MORE DATA ACCUMULATES THAT ILLUMINATES HOW SCHOLARSHIP IS USED AND REUSED IN THE ONLINE WORLD.



WHAT YOU CAN DO...



ASK

your publishers if they are using or considering the use of altmetrics. Ask them why



CONTACT

the altmetrics companies and ask them what they can do for you, your research team or your publication



CONSIDER

the value of adding altmetrics to your CV, departmental and social media profiles



TALK

to your library about metrics, altmetrics and the scholarly use of social media



FOLLOW

the conversation at [#altmetrics](#) on Twitter



FURTHER READING

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