

LEARNING SKILLS TEAM

The Altmetrics logo consists of the word "Altmetrics" in a white, bold, sans-serif font, centered within a solid dark blue rectangular background.

Library and Learning
Resources



WHAT ARE ALTMETRICS?

“web-based metrics for the impact of scholarly material, with an emphasis on social media outlets as sources of data” (Shema et al. 2014, in Bornmann, 2014)

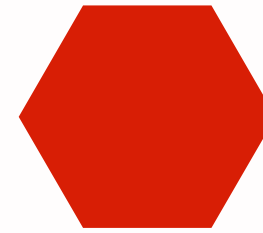
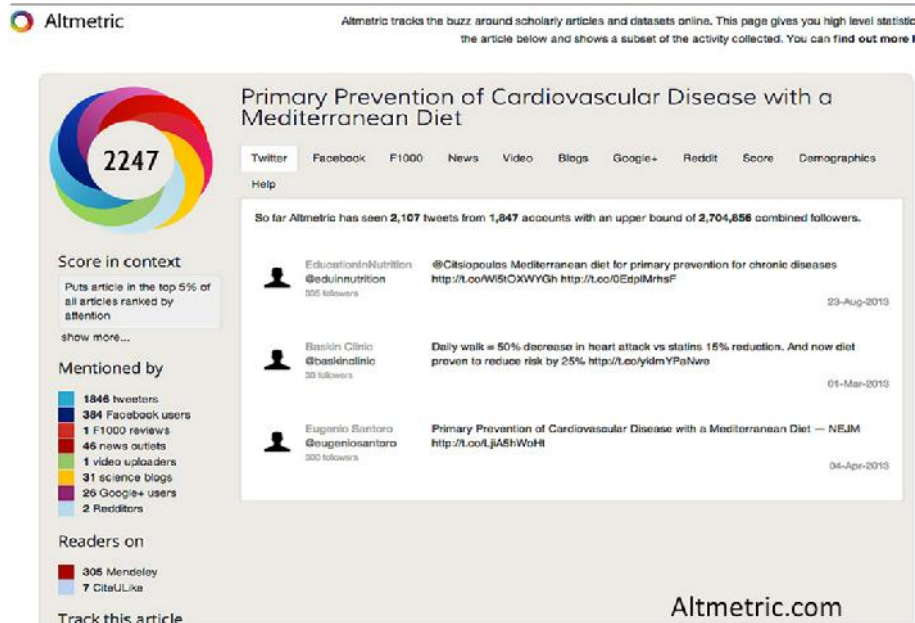
Priem et al (2010) describe altmetrics as “the creation and study of new metrics based on the Social Web for analysing, and informing scholarship” making use of the “scholarly ecosystem”.

Scholarly communication is changing, and we need new and different ways of measuring our communications in order to get the complete picture of the impact, particularly societal impact, of research outputs (Wilson, 2013), many of which are not traditional papers and therefore cannot be measured by traditional metrics, e.g. citation counts or the Journal Impact Factor

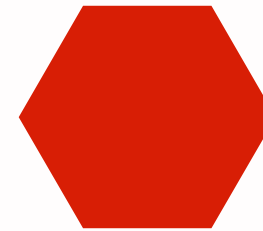
.Altmetrics are “web-based metrics for the impact of scholarly material, with an emphasis on social media outlets as sources of data” (Shema et al. 2014, in Bornmann, 2014).

So: measuring (e.g.) how many times something has been tweeted, shared on blogs, Facebook etc – you may have seen the “altmetrics donut” on online journal articles.

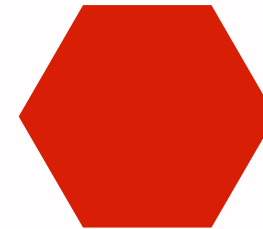
Traditional metrics



Peer review



Journal impact factor



Citation count
(e.g. H-index)

What's wrong with traditional metrics?

Peer review

is relatively slow and encourages conventionality. It also fails to hold reviewers accountable or limit the volume of research.

Citation counting

measures are useful, but metrics like the h-index are even slower than peer-review. Citation measures are narrow, meaning that influential work may remain uncited. They neglect impact outside academia, and also ignore the context and reasons for citation.

The Journal Impact Factor (JIF)

(JIF) is incorrectly used to assess the impact of individual articles. “[T]he exact details of the JIF are a trade secret, and [...] significant gaming is relatively easy.” (Priem, et al. 2010).

Peer review



Image of peer review

Peer review is one of the gold standards of science. It's a process where scientists ("peers") evaluate the quality of other scientists' work. By doing this, they aim to ensure the work is rigorous, coherent, uses past research and adds to what we already knew.

Impact factor



Image of impact factor

The **impact factor (IF)** is a measure of the frequency with which the average article in a journal has been cited in a particular year. It is used to measure the importance or rank of a journal by calculating the times its articles are cited.

The calculation is based on a two-year period and involves dividing the number of times articles were cited by the number of articles that are citable.

Calculation of 2010 IF of a journal:

A = the number of times articles published in 2008 and 2009 were cited by indexed journals during 2010.

B = the total number of "citable items" published in 2008 and 2009.

$A/B = 2010 \text{ impact factor}$

Citation count



Image of 'citation needed' placard

Impact or "quality" of an article is assessed by counting the number of times other authors mention it in their work.

Citation analysis involves counting the number of times an article is cited by other works to measure the impact of a publication or author.

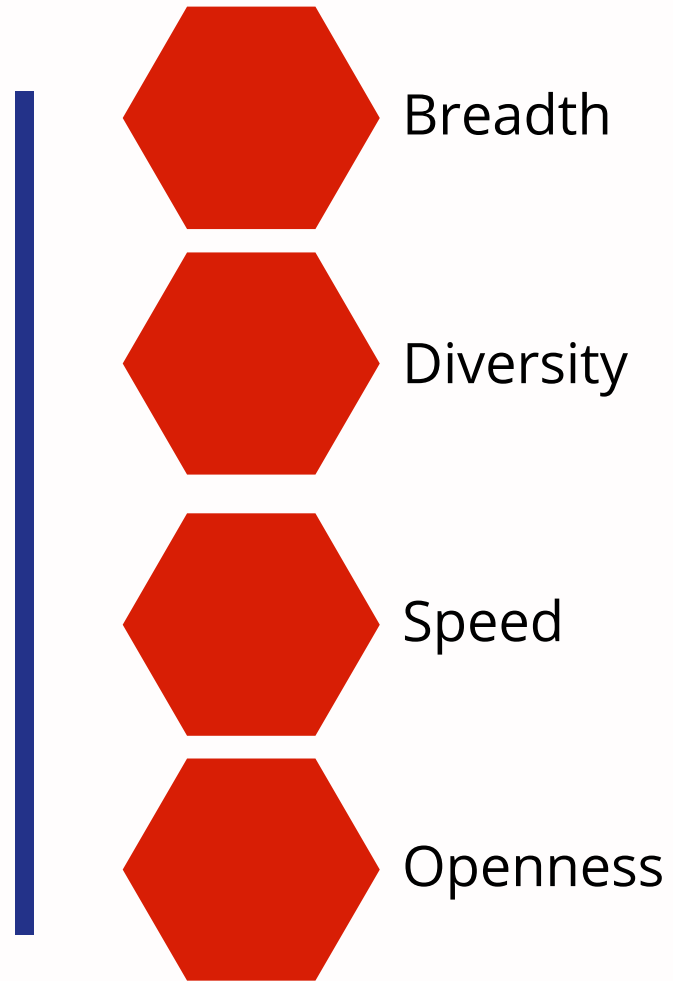
The H-Index is one specific method utilizing citation analysis to determine an individual's impact. The h-index is an index to quantify an individual's scientific research output. J.E. Hirsch -

<http://www.pnas.org/content/102/46/16569>

The h-index is an index that attempts to measure both the scientific productivity and the apparent scientific impact of a scientist. The index is based on the set of the researcher's most cited papers and the number of citations that they have received in other people's publications (Wikipedia)

A scientist has index h if h of [his/her] N_p papers have at least h citations each, and the other $(N_p - h)$ papers have at most h citations each.

Advantages of altmetrics



Breadth



Image of mountains

Altmetrics can provide a greater understanding of how a publication or product is being used than traditional metrics, as they reflect the impact of the article itself, not the journal it was published in.

In addition, altmetrics will track impact of the research outside academia, the impact of influential but uncited work, and the impact from sources that are not peer-reviewed (Priem, et al., 2010).

"Altmetrics expand our view of what impact looks like, but also of what's making the impact"

(Priem, et al., 2010)

Diversity



Image of legos

Altmetrics cover more types of scholarly information than traditional metrics, as they not only measure article-level metrics but also capture metrics on other research “products”, e.g. data sets and software which are often overlooked when using traditional models (Brigham, 2014).

The use of altmetrics also has particular significance for arts-based research outputs, which are very often not in the form of journal articles and so cannot be measured using traditional metrics.

As well as being diverse in their coverage of research impact, altmetrics also reveal how the research affects a wider diversity of people – people may engage with research outputs via social media (e.g. through sharing on Twitter or Facebook) who would otherwise not have been aware of them.

Speed

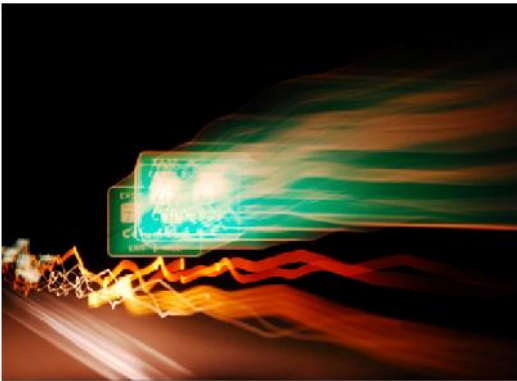


Image of long exposure to represent speed

Altmetrics aggregators pull data from social media sources on a daily or weekly basis, and produce information more quickly than traditional metrics (Brigham, 2014).

Openness

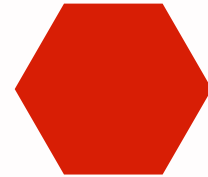


Image of open sign

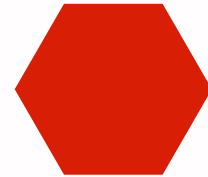
Wouters and Costas argue that, as a rule, it is easy to obtain altmetric data (Bornmann, 2014). In addition, advocates of altmetrics believe that they have the potential to be less open to gaming than traditional metrics.

They use algorithms to detect and correct fraudulent activity, as is the case with online advertisers, social news sites, Wikipedia and search engines (Priem, et al., 2010).

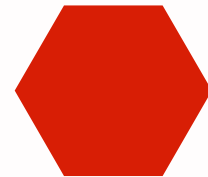
Concerns about altmetrics



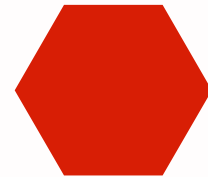
Manipulation / gaming



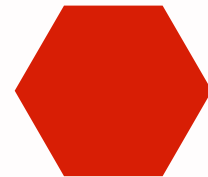
Ambiguities



Lack of regulations / standards



Problems with social media as tools



Lack of evidence

MANIPULATION AND GAMING

Thelwall (2014) argues that altmetrics should not be used to help evaluate academics for anything important because they can easily be manipulated. Social websites tend to have no quality control and no formal process to link users to offline identities, meaning it would be easy to systematically generate high altmetric scores.

There are, e.g., companies that sell Facebook likes or the promotion of articles.

People can (and do) create fake social media profiles that could be used to endorse articles leading to inflated altmetric values. However, this is rare and can be easily spotted using algorithms, according to Liu and Adie of Almetric LLP (Brigham, 2014).

It should also be remembered that social media tools are run by commercial providers who have large stake in as many people as possible communicating as often as possible via their portals.

So far, there have been no empirical studies to investigate how much bias this promotion of communication creates for altmetrics (Bornmann, 2014).

AMBIGUITIES

It is not always obvious who has authored a research output online.

This issue could be resolved somewhat by the use of ORCID IDs but use of these is still not widespread (Brigham, 2014).

However, this issue applies also to traditional metrics. There may be multiple versions of research outputs online, and therefore using altmetrics to measure impact could result in ambiguity and redundancy (Liu and Adie, 2013) if, e.g., the same article is read and commented on by the same person across several social media sites.

This point leads on to the problem of different meanings and value present in different social media conversations.

For example, it could be argued that a discussion of a research output has more impact value than a simple mention.

But is this true and, if so, how do we measure this accurately? Can we?

LACK OF REGULATION & STANDARDS

A poorly written article could be read and/or shared many times in the mainstream media, but that does not necessarily mean it is a good article, even if its altmetric score is high. Conversely, if a good quality article is only shared between leaders of the field its altmetric score/value would be relatively low (Brigham, 2014).

As Bornmann (2014) points out, unlike in traditional citation metrics, there are no rules applying to how things are mentioned on social media platforms.

Many links to the research being discussed are included in the text in different ways or not at all, which makes it more difficult to count mentions of papers.

SOCIAL MEDIA AS TOOLS

- Differences between disciplines
- Bias
- Transience
- Normalisation
- Replication



SUMMARY

It is difficult to use altmetric figures comparatively between different disciplines. Some disciplines are more active than others online, plus there are a variety of levels of involvement depending on the social media tool depending on, for example, its appropriateness to the discipline.

This leads to a problem of bias, identified by Bornmann (2014) – not everyone uses social media, so a measurement of impact in this way will always relate to a specific sample of people.

We do not (yet) have accurate user statistics or sample descriptions from social media platforms so this bias cannot be quantified. However, it could be argued that the same bias could be applied to traditional metrics.

Social media tools are popular for a while but then fade into disuse (see Friends Reunited) so altmetric measures would need to be regularly updated and normalised if they are to remain useful (Brigham, 2014).

In traditional metrics, citations are normalised to allow cross-time and cross-field comparisons of the impact of papers. Higher altmetric scores can be expected from newer papers and papers on certain topics than for older papers and papers on other topics; therefore, altmetric data should also be normalised. Also, normalised scores allow the impact of papers on different topic and from different periods to be compared (Bornmann, 2014).

Traditional citation metrics can (usually) be replicated. However, as Bornmann (2014) argues, it is difficult to replicate altmetrics data, as social media providers change, become obsolete or make to the services they offer.

SUMMARY

Currently, many questions about altmetrics remain unanswered.

For example, evidence is needed to show that articles with higher altmetrics scores tend to be more useful to read.

Thelwall (2014) suggests that it would be difficult to get direct empirical verification for this, as data from readers about a large number of articles would be needed to cross reference with altmetric scores and that future research needs to investigate disciplinary differences in the validity and value of different types of altmetrics.

We also need more information about people who have had to do with a scientific paper in order to be able to carry out valid measurements of societal impact using altmetrics (Liu and Adie, 2013).

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CONCLUSIONS

- Altmetrics help us gain new insights
- Useful indicators of the impact of research outside academia
- Concerns about use (and usefulness)
- Further research required

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HELP / CONTACT

Research Lead Librarian:

claire.choong@canterbury.ac.uk

repository@canterbury.ac.uk

[@resrchlib_CCCU](#)

