

The Relative Citation Ratio: a New Metric from the NIH Office of Portfolio Analysis

By: Karen Gutzman, Impact and Evaluation Librarian and Patty Smith, Research Librarian

Earlier this year, the NIH Office of Portfolio Analysis introduced the Relative Citation Ratio (RCR) in order to better capture the citation impact of published research. This ratio determines the impact and influence of an article when benchmarked against publications from NIH-funded R01 awards.

How is the RCR calculated?

The RCR is calculated by dividing the *article citation rate*, which is the average number of citations an article receives each year, by the *expected citation rate*, which represents the citation rate of NIH-funded publications in the same year and disciplinary field.

$$\text{RCR} = \frac{\text{Article Citation Rate}}{\text{Expected Citation Rate}}$$

Any RCR score equal to 1.0 means that the article is doing as expected within the context of its field and when compared against the NIH benchmark. Scores less than 1.0 indicate less influence, while scores greater than 1.0 indicate greater than expected influence. The citation data used to calculate the RCR comes from various sources, including PubMed Central, European PubMed Central, CrossRef, and Web of Science.

The RCR can quickly be determined using the freely available [iCite dashboard](#). This easy-to-use dashboard asks for the PubMed IDs (PMIDs) of the article(s) of interest, or allows for a search of PubMed for those articles. The dashboard will display citation metrics for each article, including cites per year, relative citation ratio, NIH percentile ranking, and more.

How does the RCR differ from similar metrics?

Unlike similar ratios (such as Scopus's Field Weighted Citation Impact), the RCR does not determine an article's disciplinary field at the journal-level; instead it creates a field based on articles that are cited alongside it in reference lists (also known as a co-citation network). Additionally, the expected citation rate is calculated, not from a global average of all field-related publications regardless of their funding or origin, but instead focuses on publications from NIH-funded R01 awards.

How do we talk about the RCR?

The data from the iCite tool is easily accessible, and can be downloaded as a customized report. However, it can be difficult to determine how best to incorporate metrics into a narrative, or to visualize the metrics for a group of articles. Below are some ideas that you may find helpful.

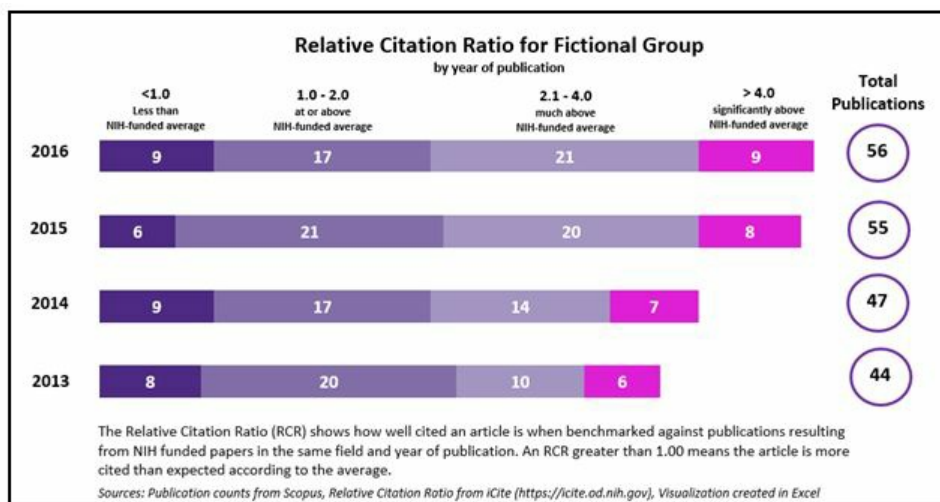
Example of the RCR for an individual researcher's publications:

Eight of my peer-reviewed works have higher citation impact than the average NIH-funded article published in the same field and year (i.e. their RCR is >1.0; iCite tool).

Example of the RCR for a group of researchers' publications:

Our group's publications are more impactful when compared against similar NIH-funded articles from the same field and year (i.e. their Weighted RCR > Total Pubs; iCite tool).

Example of visualizing the RCR metric for a group of researchers' publications:



A deeper look

The RCR is only a proxy measure for the impact of research, but it does tell an important story. As with all metrics, it is important to understand its strengths and weaknesses. Though the NIH has made their methodology and source code openly available, calculating the RCR is still highly complex, making the transparency of the metric difficult to support. Additionally, the use of co-citation networks for field-normalization can pose some technical issues. However, in an evaluation setting, the RCR provides a nice complement to a suite of citation-based metrics.

For more information on the RCR or the iCite tool, see the iCite Help documentation. Need some help understanding citation-based metrics? Contact Galter Library's [Metrics and Impact Core](#).

References

Hutchins IB, Yuan X, Anderson JM, Santangelo GM. Relative Citation Ratio (RCR): A New Metric That Uses Citation Rates to Measure Influence at the Article Level. PLoS Biol [Internet]. 2016;14(9): e1002541. doi:10.1371/journal.pbio.1002541 Available from: <http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1002541>

Lauer M. Measuring Impact of NIH-supported Publications with a New Metric: the Relative Citation Ratio. Open Mike [Blog]. September 8, 2016. Available from: <https://nexus.od.nih.gov/all/2016/09/08/nih-rcr/>

Waltman, L. NIH's new citation metric: A step forward in quantifying scientific impact? CWTS Blog. November 3, 2015. Available from: <https://www.cwts.nl/blog?article=n-q2u294>

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