

Why do we need metrics, and what can new metrics offer editors and journals?

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New Metrics

How do we measure researcher performance?



New Metrics

Life After Publication



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David Crotty

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6 research products

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Article

Dynamic in vivo imaging of postimplantation mammalian embryos using whole embryo culture.

highly cited

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(2002) Jones, Crotty, Kulesa et al.. *Genesis (New York, N.Y. : 2000)*

Expression of the murine Hoxa4 gene requires both autoregulation and a conserved retinoic acid response element.

highly cited

highly saved

(1998) Packer, Crotty, Elwell et al.. *Development (Cambridge, England)*

Sequences 5' of the homeobox of the Hox-1.4 gene direct tissue-specific expression of lacZ during mouse development.

highly cited

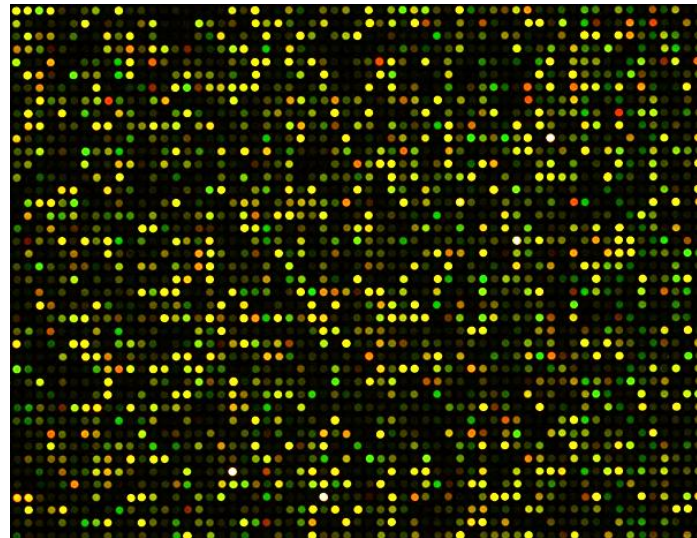
highly saved

(1993) Behringer, Crotty, Tennyson et al.. *Development (Cambridge, England)*



Why Metrics?

Lack of deep subject knowledge



Why Metrics?

Scale Problems



The Impact Factor

“One Metric To Rule Them All”

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The Impact Factor

Problems

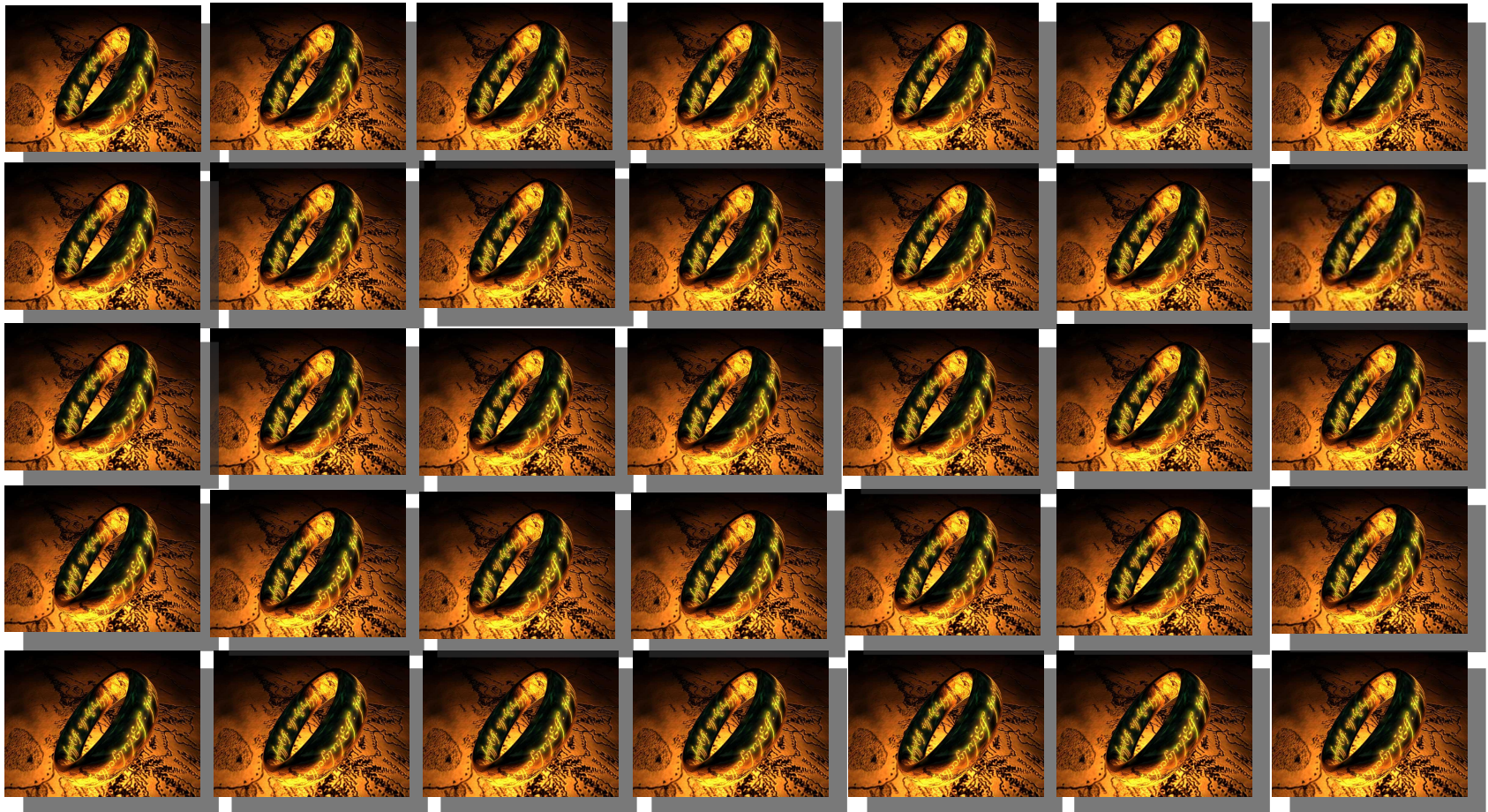
- Slow
- Limited span
- Favors review articles over primary literature
- Ranking can be greatly influenced by small number of highly cited articles
- Difficult to compare between disciplines
- False implication of accuracy

Other Kinds of Impact

- **Clinical Research:** a paper can change the way millions of patients are cared for, yet this is rarely reflected in the citation record
- **Engineering:** research is often based on problem solving, not hypothesis driven inquiry. Once the problem is solved, few further experiments are needed, hence low citation rates

New Metrics

“One Metric To Rule Them All” an archaic approach



New Metrics

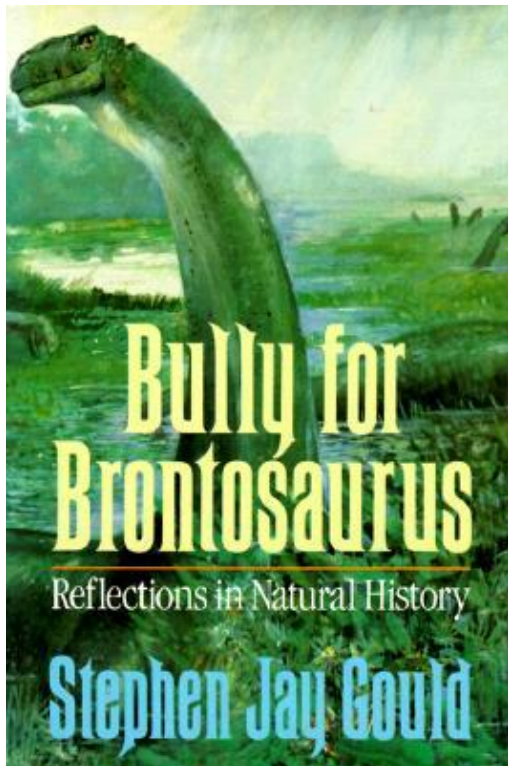
Separating Signal from Noise

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New Metrics

“The Streak of Streaks”



*“We must have comforting answers. We see pattern, for pattern surely exists, even in a purely random world... **Our error lies not in the perception of pattern but in automatically imbuing pattern with meaning**, especially with meaning that can bring us comfort, or dispel confusion... We believe in “hot hands” because we must impart meaning to a pattern—and we like meanings that tell stories about heroism, valor, and excellence.”*

New Metrics

1963 text “Informal Sociology: A Casual Introduction to Sociological Thinking”

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“It would be nice if all of the data which sociologists require could be enumerated because then we could run them through IBM machines and draw charts as the economists do. However, **not everything that can be counted counts, and not everything that counts can be counted.**”

William Bruce Cameron

New Metrics

What's being measured?



Impactstory



Altmetric



Rapid Science

**TRANSFORMING BIOMEDICAL RESEARCH
TO BRING FASTER, BETTER CURES**

New Metrics

What's being measured?

- **Usage**
 - HTML downloads and views
 - PDF downloads and views
- **Citations**
 - **PMC, CrossRef, Scopus, Web of Science**
- **Mentions and Downloads via Social Networks, Blogs and Other Online Media**
 - CiteULike, Mendeley, Twitter, Facebook, LinkedIn, Google+, Pinterest, Reddit, YouTube, Science Blogs, ScienceSeeker, Research Blogging, Wikipedia, Trackbacks, F1000, Stack Exchange, Peerage of Science, SlideShare, FigShare, GitHub, Dryad, arXiv
- **Mentions in Traditional Media**
- **Discussion and Ratings**
 - Comments, Notes, Ratings
- **Citations in Policy Documents**

Usage

Does popularity = impact?



Usage

2. Initial Severity and Antidepressant Benefits: A Meta-Analysis of Data Submitted to the Food and Drug Administration
5. Facebook Use Predicts Declines in Subjective Well-Being in Young Adults
10. Serotonin and Depression: A Disconnect between the Advertisements and the Scientific Literature

Usage

Does popularity = quality?



Altmetric

2014 Top 100

1

Experimental evidence of massive-scale emotional contagion through social networks

Kramer AD, Guillory JE, Hancock JT

2

Variation in Melanism and Female Preference in Proximate but Ecologically Distinct Environments

Culumber ZW, Bautista-Hernández CE, Monks S ...

3

Artificial sweeteners induce glucose intolerance by altering the gut microbiota

Suez J, Korem T, Zeevi D ...

4

Stimulus-triggered fate conversion of somatic cells into pluripotency

Obokata H, Wakayama T, Sasai Y ...

Sensationalism

Weird stuff draws attention



Usage

3. Fellatio by Fruit Bats Prolongs Copulation Time
4. Genome Features of "Dark-Fly", a Drosophila Line Reared Long-Term in a Dark Environment
6. Quantifying the Clinical Significance of Cannabis Withdrawal

Sensationalism

Weird stuff draws attention

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Altmetric

2014 Top 100

5

Dogs are sensitive to small variations of the Earth's magnetic field

Hart V, Nováková P, Malkemper EP ...

6

Christmas 2013: Research: The survival time of chocolates on hospital wards: covert observational study

Gajendragadkar PR, Moualed DJ, Nicolson PL ...

8

Searching the Internet for evidence of time travelers

Nemiroff RJ, Wilson T

10

Were James Bond's drinks shaken because of alcohol induced tremor?

Johnson G, Guha IN, Davies P

Social Bookmarking

Articles about articles?



MENDELEY

Papers

Popular

Latest

1. How to Choose A Good Scientific Problem
2. Whitesides' Group: Writing a paper
3. Error Bars in Experimental Biology
4. Why most published research findings are false: Author's reply to Goodman and Greenland
6. Building Theories from Case Study Research
7. Import citations into your digital library using the Mendeley Web Importer
10. Why most published research findings are false

What You Think You Know About the Web Is Wrong

Myth: We read what we click on

55% of viewers spend less than 15 seconds actively on a page

Myth: The more we share, the more we read

There is no relationship whatsoever between the amount a piece of content is shared and the amount of attention the average reader will give that content

<http://time.com/12933/what-you-think-you-know-about-the-web-is-wrong/>

New Incentives

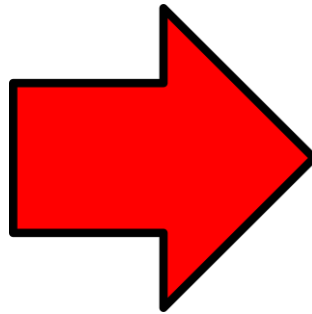
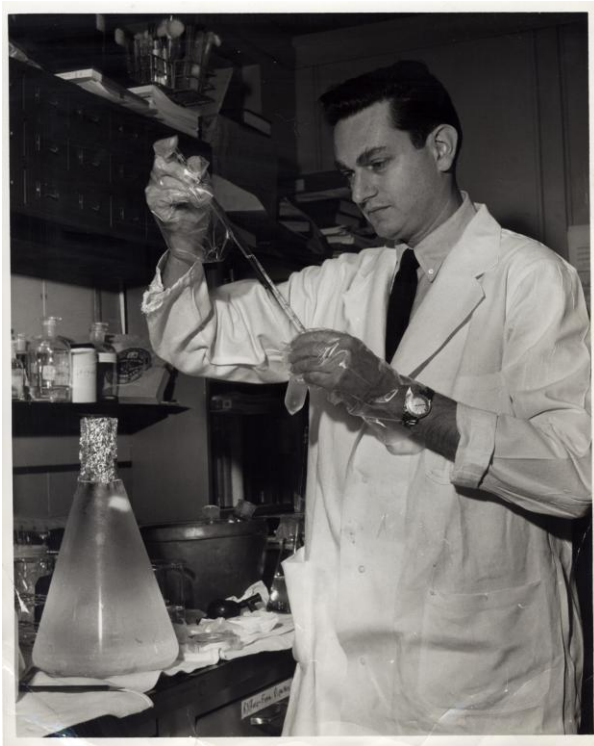
Campbell's Law

"The more any quantitative social indicator (or even some qualitative indicator) is used for social decision-making, the more subject it will be to corruption pressures and the more apt it will be to distort and corrupt the social processes it is intended to monitor."



New Incentives

Does marketing become a core activity?



What about gaming?



The image shows a screenshot of the Twitter profile for Newt Gingrich (@newtingrich). The profile includes a profile picture of Newt Gingrich, his name with a verified badge, his handle, and a bio: "Husband, father, grandfather, citizen, small businessman, author, former Speaker, candidate for president." with a link to "http://Newt.org". Below the bio is a "Following" button and a menu icon. The "Tweets" tab is selected, showing a tweet from @newtingrich: "Before vote, Boehner and McConnell should pledge only to appoint to the spending committee those who rule out tax increases." posted 20 hours ago. To the right, a sidebar shows "About @newtingrich" with statistics: 2,698 Tweets, 453 Following, 1,325,959 Followers, and 9,384 Listed. It also shows "You and @newtingrich" with a row of profile pictures of accounts followed by both, and "Similar to @newtingrich" with recommendations for Gary Sinise and foxnation.

Newt Gingrich ✓
@newtingrich
Husband, father, grandfather, citizen, small businessman, author, former Speaker, candidate for president.
<http://Newt.org>

✓ Following

Tweets Favorites Following + Followers + Lists +

newtingrich Newt Gingrich
Before vote, Boehner and McConnell should pledge only to appoint to the spending committee those who rule out tax increases.
20 hours ago

About @newtingrich

2,698	453	1,325,959	9,384
Tweets	Following	Followers	Listed

You and @newtingrich
You follow accounts that follow @newtingrich · view

Similar to @newtingrich · view all

- Gary Sinise** Gary Sinise ✓ Follow
Misc Taylor on CSI:NY. Bass player, Gary Sinise and...
- foxnation** Fox Nation ✓ Follow
Join the community that believes in the American dre...

The Attention Problem

Is Attention Flawed as a Metric, or Are We Just Measuring it Wrong?

- **Funding and Career Advancement**
 - Attention does not equal quality or impact
 - How to measure “societal impact”?
- **Library Purchasing Decisions**
 - Do these measurements tell librarians anything about what they need to know?
 - Right concept, wrong measurements?

Custom Metrics

Different Stakeholders, Different Needs

- Funding Body Grants Officer judging candidates
- Graduate Student overwhelmed by the Literature
- Researcher tracking potential misuse of controversial results
- University Development Office seeking donors
- Pharma Publicity Department seeking awareness
- Librarian managing acquisitions—what subjects interest campus researchers

Custom Metrics

Value to Editors, Publishers

- More effective marketing efforts
 - **Faster**
 - **Better measurements of what happens when you do something**
 - **Uncovering “hidden gems”**

- Editorial Strategy
 - **Faster**
 - **Which articles caught the community’s eye?**
 - **Solicit more articles in this area**
 - **Participate in the discussion**
 - **Reach new audiences**
 - **Protect the Journal’s reputation**

New Metrics

No substitute for human judgment



Thank You!

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